39

99 copper Plates

LOB

FRONTISPIECE.

W^m. Hogarth July 1760. W^m. Woollett Sculp.

THE

PERSPECTIVE

OF

ARCHITECTURE.

IN TWO PARTS.

A WORK ENTIRELY NEW;

Deduced from the PRINCIPLES of

DR. BROOK TAYLOR;

And performed by

Two RULES only of Univerſal Application.

PART THE FIRST,

CONTAINS

The Deſcription and Uſe of a new Inſtrument called the Architectonic Sector.

PART THE SECOND,

A New Method of Drawing the Five Orders, Elegant Structures, &c. in PERSPECTIVE.

BEGUN BY

COMMAND of His Preſent MAJESTY,

WHEN

PRINCE OF WALES.

BY

JOSHUA KIRBY, Deſigner in Perſpective to His MAJESTY.

LONDON:
PRINTED for the AUTHOR, in DUKE-STREET, GROSVENOR-SQUARE,
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M DCC LXI.

TO THE

KING.

May it please your Majesty,

This Work begun by Your Majesty's Command, carried on under your EYE, and now Published by Your Royal Munificence, is most humbly dedicated to Your MAJESTY.

By your Majesty's

most humble
and most dutiful
Subject, and Servant,

J. Champion S.C.R. — Joshua Kirby.

John Ryland sculp.

P R E F A C E.

WHOEVER attempts to go out of the common road of fcience, or to tread in any new and unbeaten path, muft expect fuch a fcrutiny from the public, as is confiftent with the nature of his fubject: and however trivial their opinion may have been thought by felf-fufficient writers, yet I have always efteemed it the very beft, if not the only criterion, by which a modeft author would defire to be tried.

THE following work, which I have treated in a manner entirely new, and which relates to a moft delightful fcience, may poffibly merit the attention of fuch perfons as are any ways verfed in the arts of defign; fuch as fill up their vacant hours with the ftudies of architecture and painting; and particularly thofe, who purfue them for profit or reputation. It is to their candour and judgment, that I fubmit the following fchemes and defigns, as new principles for a compleat fyftem of the Perfpective of architecture, both as it relates to the true delineation of objects, and the doctrine of light and fhadow.

OF the many treatifes, which have been wrote upon this fubject, very few have met with the public regard. Some were the labours of other men, or tranflations from injudicious writers, or elfe the product of perfons, who did not feem to confider what were the proper materials, of which fuch works ought to be compofed. Indeed, it would be almoft endlefs to give a lift of the various authors, who have at different times (within this laft century) wrote upon Perfpective: and to examine and point out the excellences of fome, and the many miftakes and errors of others, might make a large volume, and probably would be of little moment to the world. But the principles invented and publifhed by Dr. Brook Taylor, being now univerfally eftablifhed, I fhall think myfelf fafe in the main point, if I proceed in his track; and fhall have little more to do, than to keep his demonftrations conftantly in my eye, and to invent fuch fchemes as may be eafily underftood, and applied to general practice.

BUT, even this is a difficult and expenfive undertaking, and what I fhould by no means have attempted had not a Munificent H A N D held forth its affiftance, and enabled me to do that, which otherwife would have been almoft impracticable.

UNDER

PREFACE.

Under ſuch favourable and happy circumſtances, even the moſt indolent would be rouzed into action, and the moſt unpromiſing genius might be inſpired; and, if to this be added the ſolicitations of my friends on this occaſion, and the kind reception my former work has met with, I had every inducement that could be propoſed, for exerting my utmoſt abilities in the ſervice of the public; and I can with great truth aver, that to be any way uſeful to mankind, is of more weight with me, than lucrative conſiderations.

The work is indeed large, and from the great number of ſchemes, very elegantly engraved, muſt neceſſarily be expenſive *. But to write upon ſo extenſive and difficult a ſubject, without properly connecting, and thoroughly explaining, the principal parts of it, would have been like attempting to erect a perfect, and convenient building, without any regard to a neceſſary quantity of materials, the diſpoſitions of its parts, and the utility of the ſtructure.

All the figures, which are produced as general rules in this work, I have ventured to call my own; not having had any other aſſiſtance herein, than ſome elegant deſigns for the Perſpective; and likewiſe all the prints which particularly relate to the architectonic ſector, which is an inſtrument of a new and curious conſtruction; and by which, perſons wholly unacquainted with architecture, may be enabled to delineate any part of it, with elegance and exactneſs.

Now if any one ſhould ſay, that my rules (ſtrictly ſpeaking) may all be obtained from the ſtudy of Dr. Taylor, I would anſwer, that the ſame kind of remark will hold good againſt every mathematician, that has wrote ſince the time of Euclid. And I would at leaſt deſire him to conſider, whether the digeſting theorems into a regular order, deducing proper corollaries from them, and illuſtrating them by new ſchemes and examples, has not as juſt a claim to the title of original, as any thing that can be produced in an age like this, when almoſt every ſubject ſeems to be quite exhauſted.

I make no doubt, however, that the method for drawing many of the finiſhed examples, will at leaſt be conſidered as new; and they may ſeem calculated to overturn an opinion, which has long ſubſiſted, though (as I apprehend) founded on erroneous principles; I mean the making the perſpective repreſentations of columns, that

* And it would have been more ſo, but for the reaſon above-mentioned.

that are placed parallel to the plane of the picture, increase in their apparent magnitude, in proportion to their distance from the center of it. This (as I * have observed before) has occasioned much controversy, amongst painters, mathematicians, and other ingenious men; this, therefore, being neither a new, nor singular opinion, I appeal to the sense of seeing, as a most faithful guide on this occasion, and to the unbiassed judgment of those, who can best determine from practice and experience.

I HAVE nothing more to add by way of Preface, than to request a candid and impartial examination of this work, which I have endeavoured, with much care and assiduity, to make as perfect as I was able. With these hopes, I flatter myself, that the intense pains, and strict application of some years, will neither be entirely thrown away, nor censured undeservedly.

* See Dr. Brook Taylor's Perspective made easy, and published by me in one vol. in 1755, page 69.

A

DESCRIPTION and USE

OF

A New Architectonic Sector.

CHAP. I.

Introduction to the Uſe of the SECTOR.

AS the following Treatiſe is entirely applied to Architecture, we muſt of neceſſity begin with deſcribing the different Orders, and the method of drawing the various parts, before we attempt the perſpective repreſentation of them. The meaſures made uſe of have been all laid down from an Architectonic Sector; an accurate deſcription of it's uſes will anſwer all the purpoſes of an introduction.

We owe to Reviſio Bruti the form of the Architectonic Sector, who adapted it to Scamozzi's architecture; he, for reaſons beſt known to himſelf, carefully ſuppreſſed the manner of laying down the different diviſions; to us they are unknown, and we have reaſon to believe that the one, we propoſe to treat of, is conſtructed upon new principles, § and comprehends all the neceſſary meaſures for delineating the principal parts of architecture.

§ Owing to the ingenuity of that excellent workman Mr. George Adams, Mathematical Inſtrument-maker to His Royal Highneſs the PRINCE of WALES, in Fleet-ſtreet, London; who makes thoſe Sectors in ſilver, ivory, or wood; and who can with great accuracy, by the ſame principle, lay down on the vacant ſpaces any other meaſures, which the inſtrument is capable of receiving.

A General Defcription of the Inftrument.

THE orders are taken chiefly from Palladio, corrected however by the pureft examples of antiquity.

THE inftrument is compofed of a Sector and Limb; on each fide are laid down two lines, one of 15 (the ufes of which we fhall hereafter mention) the other of 60. Each of thefe divifions are fub-divided into 6, which renders it an univerfal fcale of modules for drawing the different orders; for let the Sector be opened, fo that the diameter of the intended column be fet off between 60 and 60 (the number of minutes, a module or diameter of a column is fuppofed to be divided into) and the exact meafure of any one moulding, &c. may be taken to the 6th, and even to the 12th of a minute; which is amply fufficient for the greateft accuracy.

ON the bevel or chamfered edges of the Sector are placed the numbers of the circular lines on the limb, viz. from 1 to 22 on one fide, and from 23 to 43 on the other, with the initial letters of the orders belonging to each of thofe lines.

THE limb has two fides or faces, each containing four intervals of circular lines, the general contents of which are engraved on the beginning and end of the arch.

FIVE circular lines, comprehending the five orders, form for the moft part an interval; though the firft and fourth on the firft face, and the fourth on the fecond are compofed of fix.

THE intervals are frequently fub-divided into two, three, or more fpaces, called bars; thofe are diftinguifhed by two perpendicular lines that crofs the divifions at the beginning and end of each bar, beyond which the legs of the Sector are never to be opened.

THUS much in general; we fhall now proceed to a more particular examination of the divifions laid down on the limb.

Firft Face of the LIMB.

Lines 1 to 5, Contain the heights of the five orders in colonnades and arches.
Line 6, Is divided into two bars; the firft gives the heights; the fecond the projections of the Doric leffer arch.

Second Interval of five Lines, and feven Bars.

Line 7 to 11, Firft Bar, Projections of leffer colonnades, viz. of columns without pedeftals, and the different intercolumniations to each order.
S[illegible] with pedeftals.
Third Bar, Projections of leffer arches.
Fourth Bar, Projections of greater arches.
Fifth Bar, Heights of Pedeftals.
Sixth Bar, Heights of entablatures.
Seventh Bar, Half heights of confoles.

Third Interval of five Lines and two Bars.

Line 12 to 16, Firft Bar gives the half widths, widths, and heights of doors, their entablatures, confoles, &c. proportioned to the five orders.
Second Bar, Heights of columns, with their capitals and bafes.

[illegible] a fmall fcale has been ufed to take in the entire heights of orders, with their great parts; the remaining divifions contain the fmall members of each of thefe parts, on a larger fcale.

Fourth

Fourth Interval of Six Lines.

Lines 17 to 21, Are divided into fix Bars.
Firft Bar, Heights of the entablatures of doors.
Second, The projections of the cornices of doors.
Third, Heights and projections of the architraves of doors.
Fourth, Heights of architraves, and widths of confoles.
Fifth, Heights of ballufters, proportioned to the five orders.
Sixth, Projections of ballufters.

Line 22, Confifts of five Bars.
Firft Bar, Doric flutes in plano.
Second, —— upright flutes.
Third, Flutes and fillets of columns in plano.
Fourth, ———— of upright columns.
Fifth, ———— of pilafters.

Second Face of the L I M B.

Firft Interval of Five Lines and Six Bars.

Line 23 to 27, Firft Bar, Contains the heights of the different members of impofts to the leffer arches.
Second, Contains the heights of impofts to the greater arches.
Third, Gives the widths of leffer archivolts, and projections of the leffer impofts.
Fourth, Has the widths of greater archivolts, and projections of greater impofts.
Fifth, Projections of leffer archivolts.
Sixth, Projections of greater archivolts.

Second Interval of Five Lines and Six Bars.

Line 28 to 32, Firft Bar, Contains the greater half diameters of columns and the projections of bafes.
Second, Leffer half diameters of columns, and projections of capitals.
Third, Projections of friezes and architraves.
Fourth, Projections of friezes and cornices.
Fifth, Heights of block cornices, proportioned to the five orders.
Sixth, Projections of block cornices.

Third Interval of Five Lines and Five Bars.

Line 33 to 37, Firft Bar, Heights of bafes.
Second, ——— of bafes of pedeftals.
Third, ——— of cornices of pedeftals.
Fourth, Projections of bafes of pedeftals.
Fifth, Projections of cornices of pedeftals.
Sixth, Half heights of the die of pedeftals.

Fourth Interval of Six Lines.

Line 38 to 42, Divided into Three Bars.
Firft Bar, Heights of capitals.
Second, ——— of architraves and friezes.
Third, ——— of cornices.

Line 43, Contains the heights and projections of the modern Ionic capital and entablature.
It is divided into Five Bars.
First Bar, Height of the capital.
Second, ——— of architrave and frieze.
Third, ——— of modillion cornice.
Fourth, Projection of capital.
Fifth, Projection of modillion cornice.

C H A P. II.

The Ufe of the Inftrument in drawing the Tufcan Order.

WE are now to fhew the ufe of the inftrument in drawing Orders, &c. for which purpofe we begin with the Tufcan Order, through all it's different applications, whether in fimple columns, colonnades, arches, doors, &c.

But we muft firft explain a circumftance that may feem attended with difficulty, yet is however as fimple in it's operation, as any other part of the fcale.

The fub-divifions, that mark off the different members on the limb, are little lines, ranged for the moft part on the upper fide of the circular projections, called forward divifions; but fometimes they are placed below the circular lines pointing downwards, inftead of upwards; thefe laft we term backward divifions, and are occafioned by the minutenefs of the members, at the beginning of the bar, that are too fmall to be taken off the Sector, even when the legs are fhut. Now, as the common method of fetting off the divifions of a bar is to fix one leg of the Sector at the beginning, and to open it till the other leg cuts the laft divifion of the order in this bar, which gives the total height or width, and then bringing back that leg, which we call the moveable one, to all the different forward divifions, there remains nothing but the backward ones to work off; which is effected by fixing the moveable leg at the laft divifion of the bar, as it was at firft, and unfcrewing the fixed leg, making that cut each backward divifion. But all this will become plain by practice.

Let us therefore begin with the general heights of this Order, as laid down on the firft face of the inftrument, firft interval, and firft line.

Plates I. II. III. Screw one leg of the Sector to the beginning of the line, No. 1, then move the other till it cuts the laft divifion, No. 18, and this is the total height of the order.

Bring the moveable leg back to 17, this cuts off the bafe of the pedeftal; pafs over 16, which we fhall explain prefently, and to 15 is the dye of the pedeftal; to 14 is the cornice of the pedeftal; to 13 the bafe of the column; then pafs over the divifion marked with letters that belong to doors or arches, bring the moveable leg to 5 the top of the trunk §; to 4 the capital; to 3 the architrave; to 2 the frieze, and alfo the cornice.

If we choofe to ufe the order with only a plinth, inftead of a pedeftal, then the Sector opened from 1 to 16, where the line is croffed and brought back to 14, omitting 15, cuts off the height of the plinth.

If

§ We make ufe of the word trunk, becaufe we look upon the fhaft to include the aftragal below the capital, as well as the upper cincture, whereas in working with this inftrument it is more convenient to keep the trunk diftinct from any moulding whatfoever.

It is hardly worth mentioning, that the moveable leg carried to 14, gives the height of the column with it's entablature, without either pedeſtal or plinth. In like manner the moveable leg brought to 4, cuts off the entablature without the column.

Of INTERCOLUMNIATIONS.

Plate III. Fig. A. Having thus obtained the heights of the principal parts of this Order, we now proceed to the projections; to which we ſhall join the different diſtances, or intercolumniations ſuited to it; and as thoſe intercolumniations are different in columns placed without pedeſtals, or with them, we have projections proper for each on two different bars, viz. the 1ſt and 2d upon the 2d interval of the 1ſt face.

The firſt bar gives us, beſides the projections of the columns and entablatures, two different intercolumniations, one of 3 and 1-3d modules, the other of 4 modules, or diameters.

We will begin with the 1ſt bar, 7th line; the Sector opened from the beginning No. 1, (which anſwers to the axis of the column) to the laſt diviſion No. 8, we ſhall have the greater half intercolumniation for columns, without pedeſtals; 1 to 7 gives the leſſer intercolumnation; 1 to 6 the projection of the cornice (which in this and all the other Orders is transferred from 6 to pc); the remaining numbers are backward diviſions.

Now to prevent miſtakes, we will obſerve in this place, that whenever we reverſe the legs of the Sector to take off a backward diviſion, we muſt alſo reverſe the laying down our meaſures upon paper. For example, to put down the forward diviſions in this figure, we fix our compaſſes at 1, and by extending them to 8, we get the greater half intercolumniation; but for the four backward diviſions of the plinth and column, we fix one point of our compaſſes at 8, anſwering to the end of the bar on the inſtrument, and then from thence to the firſt backward diviſion No. 2, will give us the projection of the top of the trunk; to 3 the bottom of the trunk, and alſo the capital; to 4 the baſe; and to 5 the plinth.

And we will alſo obſerve, that in reckoning the number of diviſions on the inſtrument, correſponding to thoſe on the prints, we always count the beginning of the bar 1, the neareſt backward diviſion 2, and ſo on with all the backward diviſions in their order; then we continue all our numbers from the firſt forward diviſion to the laſt number of all, which is conſtantly the end of the bar.

The columns with pedeſtals and two intercolumniations, one of 5, the other of 4 modules.

The Sector opened from the beginning of the bar No. 1 to 8 the laſt diviſion, marks the greater half intercolumniation; 1 to 7 the leſſer intercolumniation; 1 to 6 the projection of the cornice; 1 to 5 the projection of the plinth and cornice of the pedeſtal: the remaining are backward diviſions, therefore from 8 to 4 is the dye of the pedeſtal, and baſe of the column; 8 to 3 the greater diameter, and alſo the capital; 8 to 2 the leſſer diameter.

We have now the heights and projections of this Order, with or without pedeſtals; we ſhall next employ the inſtrument in the formation of arches.

The heights of theſe are on the firſt interval, and firſt or Tuſcan line, firſt face; this we have already done but as far as it relates to the Order itſelf: upon the ſame line, however, there are ſeveral diviſions marking the heights of arches, &c. which were omitted in forming colonnades, but become at preſent neceſſary.

Plate IV. Fig. C and D. Open the Sector, and from the beginning of the line No. 1 to 6, marked k, gives the bottom of the key-ſtone to the leſſer arch.

1 to 7 k, The bottom of the key-ſtone to the greater arch.
1 to 9 i, Top of the impoſt to the leſſer arch.
1 to 10 i, Bottom of the impoſt to the leſſer arch, and top of that of the greater arch.
1 to 12 i, Fixes the bottom of the impoſt to the greater arch; and theſe are all the general heights neceſſary for drawing Tuſcan arches.

We will next take the projections of arches, which are on the fecond interval, third and fourth bars, and Tufcan line.

Projections of leffer ARCHES.

And firft for the leffer arch, from 1 (which anfwers to the middle of the arch) to 13 gives the projection of the cornice.

Fig. C. 1 to 12, The greater half diameter, and projection of the capital.
1 to 11, The leffer half diameter.
1 to 10, The axis of the column.
1 to 9, The greater half diameter.
1 to 8, The greater projection of the archivault.
1 to 7, The bafe of the column.
1 to 6, The plinth.
1 to 5, The pilafter, and infide of the archivault.
1 to 4, Projection of impoft.

The remaining are backward divifions, therefore from
13 to 2, is the bottom of the key-ftone.
13 to 3, is the top of it.

Projections of greater ARCHES.

Fig. D. 1 to 13, The projection of the cornice.
1 to 12, The greater half diameter, and projection of the capital.
1 to 11, The leffer half diameter.
1 to 10, The axis of the column.
1 to 9, The greater half diameter.
1 to 8, The greater projection of the archivault.
1 to 7, The dye of the pedeftal, and bafe of the column.
1 to 6, The bafe and cornice of the pedeftal.
1 to 5, The pedeftal and leffer projection of the archivault.
1 to 4, The projection of the impoft.

The remaining are backward divifions, from
13 to 2, is the bottom of the key-ftone.
13 to 3, the top of it.

If only a fingle pedeftal, column, or entablature be wanted, we are to proceed in the following manner. Firft, for the pedeftal, the heights of which are on the firft face, fecond interval, fifth bar, Tufcan, or feventh line.

A Single PEDESTAL.

Plate XX. Fig. I. Fix one leg of the Sector at the beginning of the bar No. 1, and carry the moveable leg to the laft divifion, and we fhall know the entire height of the pedeftal; brought back to the divifion 4 cuts off the plinth; pafs over the 3d divifion then, becaufe the heights of the dye and cornice are fixed by a backward divifion, therefore now fix the moveable leg at the end of the bar No. - [illegible]d bring the other leg to No. 2, which cuts off the dye and cornice required.

If only a plinth is wanted, and not a pedeftal, then from 1 to 3 determines the height of it.

Having thus obtained the general heights of a fingle pedeftal, there now remains to fhew how to cut off the general projections, which are placed on the firft face, fecond interval, fecond bar, Tufcan line;

line; for, to avoid a repetition, thoſe meaſures muſt be taken from the great colonnades. Fix one leg of the inſtrument at No. 1, and carry the other to No. 8, which gives the greater intercolumniation, from 1 to 5 cuts off the plinth and cornice; the remaining is a backward diviſion, therefore 8 to 4 is the dye.

Of a Single COLUMN.

Columns without pedeſtals, or entablatures, are placed on the third interval, ſecond bar, twelfth line, firſt face.

The fixed leg placed at the beginning of the bar, and the moveable one carried to the laſt diviſion, gives the entire height of the column. From No. 1 to 3 cuts off the baſe; the legs of the Sector reverſed for the backward diviſions we take from the end of the bar No. 4 to No. 2, which gives the height of the column, and alſo the bottom of the capital.

The general projections of the column; firſt face, ſecond interval, ſecond bar, ſeventh line.

Fix the Sector as before, then 1 to 8 is the greater intercolumniation; the remainder are backward diviſions, therefore 8 to 2 is the top of the trunk; 8 to 3 the bottom of the trunk, and alſo the capital; and 8 to 4 the baſe.

Of an ENTABLATURE.

For the general heights of an entablature only, firſt face, ſecond interval, ſixth bar, Tuſcan line.

The inſtrument fixed as before, then

1 to 4, Cuts off the entire height of the entablature.
1 to 3, The architrave.
1 to 2, The frieze, and alſo the cornice.

For the general projections of an entablature only; firſt face, ſecond interval, ſecond bar, ſeventh line.

Fix the Sector at the beginning of the bar, then

1 to 8, Is the greater intercolumniation.
1 to 6, The cornice; and the backward diviſion
8 to 2, Gives the frieze, and alſo the bottom of the architrave.

Of every particular MEMBER.

Thus far the inſtrument has aſſiſted us in fixing the general meaſures of this Order: there remains to ſhew the method of ſetting off the heights and projections of every individual member.

We ſhall begin with the baſe of the pedeſtal, the heights of which are laid down on the ſecond face of the limb, third interval, ſecond bar, thirty-third line.

One leg of the Sector placed at the beginning as uſual, and the other at the end of the bar No. 4, we take the height of the baſe, as drawn by the preceeding rules, and then try on what oppoſite numbers of the Sector that opening of the compaſſes will coincide; for it is from thoſe numbers ſo diſcovered we muſt ſet off all the particular mouldings of the principal parts drawn before.

Let us ſuppoſe that the openings for the ſmall ſcale were taken between 37 1-3d and 37 1-3d on the Sector; we ſhall find theſe will nearly anſwer between 8 and 8 on the ſcale for the ſeveral members, which muſt therefore carefully be remembered, and kept to.

But ſince drawing the members from ſo ſmall a ſcale, as between 8 and 8, would be attended with ſome confuſion, or, at leaſt would not be ſo intelligible as one much larger; we have therefore made every Order ſeparate, and to the ſcale of 30 to 30; though the ſhrinking of the paper in printing has made the prints about 29 1-half to 29 1-half.

Height of the Base of the PEDESTAL.

PLATE III. Fig. A. The Sector being fixed as before, then 1 to 4 cuts off the height of the base.

1 to 3, The Doric cyma.
1 to 2, The fillet, and also the height of the plinth.

The Dye of the PEDESTAL.

THE half height of the dye of a pedestal is laid down on the second face, third interval, sixth bar, thirty-third line.

THE Sector opened from the beginning 1, to the end of the Tuscan line 3, gives half the height of the dye.

The PLINTH Only.

IF only a plinth is to be added to the column, and not a pedestal, then the Sector opened from the beginning of the Tuscan line to the second division, mark'd with P, gives half the height of the plinth.

Cornice of the PEDESTAL.

CORNICE of pedestals, third interval, third bar, thirty-third line.

THE Sector opened from the beginning of the bar 1, to the last division 3, gives the entire cornice of the pedestal.

1 to 2, Gives the height of the cyma reversa, and also of the regula.

Base of the COLUMN.

BASE of the column, third interval, first bar, thirty-third line, second face.

ONE leg of the Sector placed at the beginning of the bar, No. 1, the other carried to the last division 4, marks the entire height of the base.

1 to 3, Cuts off the lower cincture.
1 to 2, The heights of the tore and plinth.

Heights of the CAPITAL.

FOR the heights of the capital, we must take the fourth interval, of the second face.

THE capital is laid down on the first bar, thirty-eighth line.

ONE leg of the Sector fixed to the beginning of it, No. 1, the other carried to the last division 7, give the entire height.

1 to 6, Is the bottom of the abacus.
1 to 5, That of the ovolo.
1 to 4, The fillet.

THE rest are backward divisions.

7 to 3, Is the bottom of the neck of the column.
7 to 2, That of the astragal, and the upper cincture.

Architrave and Frieze.

THE next or second bar on this fourth interval, and the thirty-eighth line, gives the heights of the Tuscan architrave and frieze.

OPENING

Opening the Sector as uſual from the beginning No. 1, to the laſt diviſion 5, marks the entire height of both thoſe parts.

1 to 4, That of the frieze.
1 to 3, Fillet of the architrave.
1 to 2, The heights of the firſt and ſecond faſcia.

The CORNICE.

Heights of cornices are to be found on the third bar of the fourth interval, thirty-eighth, or Tuſcan line, ſecond face.

The Sector being opened from the beginning, No. 1, to the laſt diviſion, ſhews the entire height.

1 to 7, The upper fillet.
1 to 6, The cyma.
1 to 5, The fillet.
1 to 4, The corona.
1 to 3, The ovolo.
8 to 2, Being a backward diviſion, gives the height of the fillet and cavetto.

Projections of the MEMBERS.

These are all the heights of this order. We ſhall now take, in the ſame manner, the projections, which are all ſet off from the axis of the column; and from thoſe points in the plates, where the aſteriſks are marked within a circle.

The PEDESTAL.

And firſt for the baſe of the pedeſtal; ſecond face, third interval, fourth bar, Tuſcan line.

The Sector opened from the beginning, No. 1, to the laſt diviſion 7, gives the projection of the plinth.

1 to 6, That of the fillet.
Fig. A. 1 to 5, and 1 to 3, The projection of the Doric cyma; paſſing by the fourth diviſion, marked P, which is the projection of the plinth as in Fig. B.
1 to 2, That of the dye.

Projections of cornice of pedeſtals, ſecond face, third interval, fifth bar, Tuſcan line.

The Sector opened from the beginning, No. 1, to the laſt diviſion 5, is the projection of the fillet, or corona.

1 to 4, and 1 to 3, That of the cyma reverſa.
1 to 2, That of the dye.

The COLUMN.

Base of the column; ſecond face, ſecond interval, firſt bar, Tuſcan or twenty-eighth line.

The Sector opened from the beginning, No. 1, to the laſt diviſion 4, gives the projection of the plinth and tore.

1 to 3, That of the cincture.
1 to 2, The greater half diameter of the column.

Lesser half diameter and capital; ſecond face, ſecond interval, ſecond bar, Tuſcan line.

The Sector opened from the beginning, No. 1, to the laſt diviſion 5, contains the projection of the abacus.

1 to 4, That of the ovolo.
1 to 3, The fillet of the ovolo, the upper cincture, and the center of the aſtragal.
1 to 2, The neck, and leſſer half diameter of the column.

The ENTABLATURE.

Frieze and architrave; ſecond face, ſecond interval, third bar, Tuſcan line.

The Sector opened as uſual, from the beginning, No. 1, to the laſt diviſion 4, gives the projection of the fillet of the architrave.

1 to 3, The upper faſcia.
1 to 2, The lower faſcia and frieze.

Frieze and cornice; ſecond face, ſecond interval, fourth bar, Tuſcan line.

The Sector opened from 1 to the laſt diviſion 9, gives the fillet of the cyma, or entire projection of the cornice.

1 to 8, The lower part of the cyma, with it's fillet.
1 to 7, The corona.
1 to 6, The tooth of the corona, or end of the cyma.
1 to 5, The part of the corona, broke by the cyma.
1 to 4, The lower part of the cyma, or ovolo, and fillet, alſo the top of the cavetto.
1 to 3, The cavetto.
1 to 2, The frieze.

Heights and Projections of IMPOSTS, &c.

We have now laid down the heights and projections of all the parts of this Order; which hold equally in ſingle columns, colonnades, or arches: but in this laſt diſpoſition there are two capital parts, viz. impoſts, archivaults, and key-ſtones, whereof we have only had the general meaſures; remains therefore the particular mouldings.

Plate XVII. Thoſe of the impoſts are laid down on the ſecond face, firſt interval; and the heights of thoſe adapted to the leſſer arches are marked on the firſt bar, twenty-third, or Tuſcan line.

Let the Sector be opened from the beginning of the line 1, to the laſt diviſion 7, and we ſhall have the entire height of the impoſt.

1 to 6, Cuts off the plat-band or faſcia.
1 to 5, The Doric cyma.
1 to 4, The fillet.

Then for the two backward diviſions.

7 to 3, Gives the height of the corona.
7 to 2, That of the cavetto, and alſo the fillet above it.

The heights of impoſts for greater arches are on the ſecond face, firſt interval, ſecond bar, Tuſcan line.

The Sector opened from the beginning 1, to the laſt diviſion 8, gives the entire height.

1 to 7, Cuts off the lower faſcia.
1 to 6, The upper faſcia.
1 to 5, The fillet.
1 to 4, The cyma.
1 to 3, The fillet.

And laſtly, the backward diviſion.

8 to 7, Gives the height of the Doric cyma, and fillet above it.

Projections

Projections of Impofts, and Width of Archivaults.

The projections of thefe impofts are on the firft interval of the fecond face, third and fourth bars: and as archivaults always fall upon the impoft, we fhall at the fame time take off the different members belonging to them.

And firft for the leffer impofts, and archivaults; third bar, Tufcan line.

The Sector opened from the beginning 1, to the laft divifion 12, gives the entire breadth of the archivault, and projection of the impoft.

1 to 11, That of the cavetto.
1 to 10, The corona.
1 to 9, The fillet.
1 to 8, and 1 to 7, The Doric cyma.
1 to 6, The fafcia.
1 to 5, The pilafter, and total width of the archivault.
1 to 4, Cuts off the firft fafcia of the archivault.

Then follow the backward divifions.

12 to 3, Is the fecond fafcia.
12 to 2, The Doric cyma, and alfo it's fillet.

We next come to the greater impofts, and archivaults, fourth bar, Tufcan line.

The Sector opened from the beginning 1, to the laft divifion 12, gives us the width of the archivault, and entire projection of the impoft.

1 to 11, and 1 to 10, Is the projection of the Doric cyma.
1 to 9, The fillet and cyma.
1 to 8, The lower part of the cyma and fillet.
1 to 7, That of the upper fafcia.
1 to 6, The lower fafcia.
1 to 5, The projection of the pilafter, and total width of the archivault.
1 to 4, Cuts off the firft fafcia of the archivault.

And now for the backward divifions.

12 to 3, Is the fecond fafcia.
12 to 2, The Doric cyma, with it's fillet.

Thus we have the widths or heights of archivaults; the projections of their members are feldom drawn in plans, but yet abfolutely neceffary to be known; they are therefore on the fifth and fixth bars, of the firft interval, fecond face.

Projections of Archivaults.

N. B. As thefe projections take up too fmall a portion on the fcale, to admit of their being laid down by themfelves, it was neceffary to affix fome arbitrary width before them; the method we have followed is to repeat the height or width of each archivault, which is followed by the projections.

Therefore in drawing any of their projections upon paper, we muft always have an eye to this additional width, which, though neceffary in the conftruction of the inftrument, and fetting off the divifions, is of no ufe in the drawing.

First, projections of archivaults for the leffer arches; fifth bar, Tufcan line.

The Sector opened from the beginning, No. 1, to the laft divifion 6, gives (as we have faid before) the width of the archivault, and it's projection.

1 to 5, } The Doric cyma.
1 to 4, }

1 to 3, } The fafcias.
1 to 2, }

Projections of archivaults of greater arches; fixth bar, Tufcan line.

The Sector opened from the firft to the 6th divifion, as before, gives the width and projection of the archivault.

1 to 5, } The Doric cyma.
1 to 4, }

1 to 3, } The fafcias.
1 to 2, }

Of Block CORNICES.

The next thing we fhall take from the inftrument is the method of delineating block cornices; thefe are of five kinds, one adapted to each order; on the fecond face, fecond interval, fifth and fixth bars, Tufcan line.

First for the heights; fifth bar.

Plate XVIII. The Sector opened from the beginning of the firft bar, to the laft divifion 9, gives the entire height.

1 to 8, The upper fillet.
1 to 7, The cyma.
1 to 6, The fillet.
1 to 5, The corona.
1 to 2, The top of the modilion.

Of the two backward divifions.

9 to 3, Is the bottom of the modilion band.
9 to 2, Gives the height of the Doric cyma.

Projections of the block cornice; fixth bar.

The Sector opened from the beginning 1, to the laft divifion 8, gives the entire projection of the cornice beyond the upright of the wall.

1 to 7, The bottom of the cyma and fillet.
1 to 6, The corona.
1 to 5, The outward modilion.

Of the three backward divifions.

8 to 4, Cuts off half of the breadth of an inward modilion.

8 to 3, } The Doric cyma.
8 to 2, }

Of

Of BALLUSTERS.

We come next to ballufters, which are alfo adapted to the five Orders; thefe are on the firft face, fourth interval, fifth and fixth bars.

Heights of ballufters; fourth interval, fifth bar, Tufcan line.

N. B. Thefe are drawn by the fcale of fixty.

Plate XIX. The Sector opened from the beginning 1, to the laft divifion 16, gives us the entire height.

1 to 15, Cuts off the upper fillet, or abacus.
1 to 14, The ovolo.
1 to 13, The fillet.
1 to 12, The neck.
1 to 11, The aftragal.
1 to 10, The fillet.
1 to 8, The height of the vafe.

(And obferve that 1 to 9 gives only the line on which the greateft projection of the vafe is to be marked; but this divifion is of no other ufe in the heights, and therefore marked with a crofs on the bar)

1 to 7, The lower aftragal.
1 to 6, The fillet.
1 to 5, The fcotia.
1 to 4, The fillet.
1 to 3, The tore.
1 to 2, Cuts off the plinth, and gives, at the fame time, the height of the fub-plinth.

Projections of ballufters; fixth bar.

The Sector opened from the beginning 1, to the laft divifion 10, on the Tufcan line, gives the projection of the entire ballufter.

In all the other fcales of this inftrument, the projections are marked from the central line of the bottom, (arches excepted) but here it is neceffary to fet off the projections of the ballufter from A or C, on each fide of it's axis.

This width, 1 to 10, the total projection of the fub-plinth put on paper, we bifect, which gives us the femi-diameter of this ballufter, which could not be laid down upon the limb; then from A towards C,

1 to 9, Is the projection of the plinth and tore of the bafe, and the abacus alfo of the capital.
1 to 8, The ovolo of the capital.
1 to 7, The greater projection of the vafe, and the lower fillet of the fcotia belonging to the bafe.
1 to 6, The fillet of the capital, and aftragal, at the neck.
1 to 5, The fillet to the top of the vafe.
1 to 4, The lower aftragal beneath the vafe.
1 to 3, The upper fillet of the fcotia, top of the vafe, and neck of the capital.
1 to 2, The narroweft part of the fcotia.

We have now given an example of every thing that can be drawn from the inftrument, except flutes, which do not belong to this Order; and doors with their ornaments.

Of DOORS.

Doors are ſometimes placed in colonnades, as in porticos of temples; and then their heights muſt be proportioned to the columns. To do this upon the ſcale; after having drawn the Order, as laid down on the firſt face, firſt interval, Tuſcan line, one leg of the Sector fixed at the beginning of the Tuſcan line 1, let the other be opened to 11, marked d, upon the limb, then we ſhall cut off the height of doors proportioned to colonnades, without pedeſtals. 1 to 8 marked alſo d, cuts off the height of doors for colonnades with pedeſtals. Theſe two diviſions, 8 and 11, were not mentioned when we were drawing the heights of the Order, being of no uſe, except for the purpoſe mentioned.

If doors are to be placed in arches, their height is fixed, which we ſhall explain in the Ionic Order.

Heights of doors, and their entablatures; firſt face, third interval, firſt bar, ſeventeenth, or Tuſcan line.

Having determined either the height, width, or half width of a door intended to be drawn, fix one leg of the Sector at the beginning of the bar, and open the other to any one of theſe given lengths, ſuppoſe the half width, then the meaſure of that taken with the compaſſes, from the ſcale the plan is to be drawn by, muſt be applied to the Sector, and where it coincides upon two oppoſite numbers, which in this figure is 23, 23, will become the proper ſcale for the general height of doors.

General Heights of DOORS.

Plate XX. The moveable leg of the Sector carried to the laſt diviſion of the line 12, gives the entire height of the door with it's entablature.

1 to 11, Cuts off the cornice.
1 to 9, The frieze.
1 to 8, Cuts off the architrave, and conſequently 1 to 8 is the height of the door without the entablature.
1 to 3, The width of the door.
1 to 2, The half width, which we begun with.—— § If we make uſe of a kneed architrave, then after taking
1 to 8, The height of the door,
1 to 5, Gives the depth of the knee.

Heights of CONSOLES.

If a conſole is to be added, it is generally made to ſupport the cornice, and to terminate with the bottom of the knee, with a leaf falling from it.

1 to 11, Therefore gives the top of the conſole.
1 to 10, The eye of the upper volute.
1 to 7, The top of the lower volute.
1 to 6, The eye of the lower volute.
1 to 5, The bottom of the lower volute.
1 to 4, Cuts off the length of the leaf.

Having thus got the general heights of the entablatures of doors, we now come to the particular mouldings; which are on the firſt face, fourth interval, firſt bar.

Heights of Entablatures of DOORS.

Heights of entablatures of doors; firſt bar, Tuſcan line.

The Sector opened from the beginning 1, to the laſt diviſion 13, is the entire entablature.

1 to 12,

§ We ſhall conſider this article more fully hereafter; for in this example the kneed architrave and conſole are purpoſely omitted.

Plate XXII.

1 to 12, Cuts off the upper fillet of the cornice.
1 to 11, The cyma.
1 to 10, The fillet.
1 to 9, The corona.
1 to 8, The ovolo.
1 to 7, The fillet.
1 to 6, Cuts off the cavetto, and the entire cornice.
1 to 5, Cuts off the frieze, and gives us the top of the architrave.
1 to 4, The fillet of the architrave.
1 to 3, The Doric cyma.

The backward diviſion.

13 to 2, Gives the upper and lower faſcia.

Projections of Cornices for DOORS.

Projections of the cornices of doors; ſecond bar.

The Sector opened from the beginning 1 to the laſt diviſion, is the greateſt projection of the cyma and fillet.

1 to 6, The fillet.
1 to 5, The corona.
1 to 4, The ovolo.

The backward diviſions.

7 to 3, The fillet of the cavetto.
7 to 2, The bottom of the cavetto.

Of Architraves for DOORS.

Projections of the architraves; third bar.

As the entire projections of architraves, are too ſmall to be laid down by themſelves on the ſcale, we are obliged here, as in archivaults, to add ſome certain meaſure before them; for which purpoſe we chooſe to repeat the height of the architrave itſelf.

The Sector opened from the beginning of the bar to 6, the laſt diviſion, gives us both the height and projection of the architrave.

1 to 5, and 1 to 4, } The projections of the Doric cyma.
1 to 3, That of the upper faſcia.
1 to 2, The lower faſcia.

Of CONSOLES.

Plate XXIII. Widths of conſoles; fourth interval, fourth bar, ſeventeenth line, firſt face.

These, like the laſt, contain too ſmall a ſpace to be laid down by themſelves; but as the conſole is generally placed by the ſide of the architrave, we add the height of the architrave to it, which ſhall be more fully explained in the next Order.

In this Order, the conſole is plain without any members, ſo that we have nothing but the entire width to lay down.

The Sector opened from the beginning 1, to the end of the line 3, gives us (as we faid before) the height of the architrave, and breadth of the confole.

1 to 2, Cuts off the width of the confole.

N. B. Since the different heights are at a confiderable diftance from each other, and would, if put at large on the Sector, take up too much fpace, we have therefore laid down only one half of their real heights, which muft carefully be remembered.

Half heights of confoles; firft face, fecond interval, feventh bar, Tufcan line.

Fix one leg of the Sector at the beginning of the bar 1, and the moveable leg carried to 7, gives one half of the entire height of the confole.

1 to 6, Repeated, The eye of the upper volute.
1 to 5, Repeated, The bottom of this volute.
1 to 4, Repeated, The top of the lower volute.
1 to 3, Repeated, The eye of the lower volute.
1 to 2, Repeated, The bottom of the lower volute, and alfo the top of the leaf.

The USE of the

ARCHITECTONIC SECTOR,

In drawing the DORIC ORDER.

General Heights of the ORDER.

CHAP. III.

WE shall next shew the uſe of the inſtrument in drawing the Doric Order, &c.

We begin with the general heights of this Order, which are upon the firſt face of the limb, firſt interval, ſecond line.

Screw one leg of the Sector to the beginning of the ſecond line, No. 1; then move the other till it cuts the laſt diviſion, No. 18; this is the total height of the Order.

Plate V. Fig. A. B. Bring the moveable leg back to 17, this cuts off the baſe of the pedeſtal.

1 to 16, The dye.

1 to 15, The cornice.

1 to 14, The baſe of the column.

Then paſſing over the diviſions marked with letters which belong to doors, or arches, carry the moveable leg from

1 to 5, The top of the trunk.

1 to 4, The capital.

1 to 3, The architrave, including the tenia.

The remaining number is a backward diviſion; therefore unſcrew the fixed leg, and place the moveable one to No. 18 the laſt diviſion on the line, then bring the other to the backward diviſion, which will cut off the frieze, and alſo the cornice. See an article in page 4, and alſo in page 5, concerning backward diviſions.

The moveable leg carried to No. 15, gives the height of the column, with it's entablature, without a pedeſtal.

In like manner the moveable leg brought to 4, cuts off the entablature, without a column.

Projections of COLONNADES.

Thus having obtained the heights of the principal parts of this Order, we now proceed to the projections, and the different diſtances or intercolumniations ſuited to it which are on the firſt and ſecond bars of the ſecond interval, ſecond line, firſt face.

The firft bar gives, befides the projections of the column and entablature, two different intercolumniations, one of two modules, the other of one module, and fifteen minutes.

We fhall begin with the firft bar, eighth line.

The Sector, opened from the beginning of the bar, No. 1, (which anfwers to the axis of the column) to the laft divifion 8, we fhall have the greater half intercolumniation.

1 to 7, Gives the leffer half intercolumniation.
1 to 6, The projection of the cornice.

The remaining numbers are backward divifions, fo that

8 to 5, Is the projection of the plinth, or bafe of the column.
8 to 4, The capital.
8 to 3, The greater half diameter of the column.
8 to 2, The leffer half diameter, and neck of the capital.

Second bar, fecond interval, eighth line.

The Doric column with pedeftals, and two intercolumniations, one of two modules and a half, the other of one module, fifty-two minutes and a half.

The Sector opened from the beginning of bar No 1, to 9 the laft divifion, marks the greater half intercolumniation.

1 to 8, The leffer half intercolumniation.
1 to 7, The projection of the cornice.
1 to 6, The plinth, and cornice of the pedeftal.

The remaining numbers are backward divifions, therefore

9 to 5, Gives the projection of the dye, and bafe of the column.
9 to 4, The projection of the capital.
9 to 3, The greater half diameter.
9 to 2, The leffer half diameter.

We have now the heights and projections of this Order, with, or without pedeftals, with their different intercolumniations; alfo the height of columns, and pedeftals feparately: we fhall next employ the inftrument in the formation of arches.

The heights of thefe are on the firft interval, and fecond, or Doric line: this we have already done, as far as relates to the Order itfelf; upon the fame line, however, there are feveral divifions, marking the heights of arches, &c. which were omitted in forming colonnades, but become at prefent neceffary.

Plate V. Fig. D. G. Open the Sector from the beginning of the Tufcan line, No. 1 to 6, marked k, this gives the bottom of the key-ftone to the leffer arch.

1 to 7 k, The bottom of the key-ftone to the greater arch.
1 to 8 i, Top of the impoft to the leffer arch.
1 to 10 i, Bottom of the impoft to the leffer arch.
1 to 11 i, Top of the impoft to the greater arch.
1 to 13 i, Bottom of the impoft to the greater arch.

These are all the general heights neceffary for drawing Doric arches; we fhall next proceed to their projections, which are on the third and fourth bars of the fecond interval, on the firft face of the limb.

Projections

Projections of Doric Arches, without Pedeſtals.

First face, ſecond bar, third interval, eighth line.

Plate V. Fig. G. From 1 to 12, (which anſwers to the middle of the arch) is the projection of the cornice; from

1 to 11, The capital.
1 to 10, The leſſer half diameter.
1 to 9, The axis of the column.
1 to 8, The greater half diameter.
1 to 7, The outſide of the archivault.
1 to 6, The baſe of the column.
1 to 5, The pilaſter and inſide of the archivault.
1 to 4, The impoſt.

And the backward diviſions,

12 to 3, and 12 to 2, Are for the upper and under part of the key-ſtone.

Projections of Doric Arches, with Pedeſtals.

First face, ſecond interval, fourth bar.

Fig. D. From 1 to 13, Is the projection of the cornice.

1 to 12, The capital.
1 to 11, Leſſer half diameter.
1 to 10, The axis of the column.
1 to 9, The greater half diameter.
1 to 8, The outſide of the archivault.
1 to 7, The baſe of the column.
1 to 6, The baſe and cornice of the pedeſtal.
1 to 5, The pilaſter and inſide of the archivault.
1 to 4, The impoſt.

And the backward diviſions,

13 to 3, and 13 to 2, Are the upper and under part of the key-ſtone.

Heights and Projections of the Doric Leſſer ARCH.

Plate VI. Heights of Doric leſſer arch are laid down on the firſt face, ſixth line, firſt bar.

1 to 10, Is the entire height of the order.
1 to 9, The trunk.
1 to 8 i, The bottom of the impoſt.
1 to 7 i, The top of the impoſt.
1 to 6 k, The bottom of the key-ſtone.
1 to 5, The top of the trunk,
1 to 4, The capital.
1 to 3, The architrave.

The laſt is a backward diviſion,

10 to 2, Which gives the top of the frieze, or bottom of the cornice,

Projections of Doric leſſer arch, firſt face, ſecond bar, ſixth line.

1 to 11, Projection of the cornice;
1 to 10, The capital.

K

1 to 9,

1 to 9, The leffer half diameter.
1 to 8, The axis of the column.
1 to 7, The greater half diameter, and the outfide of the archivault.
1 to 6, The bafe.
1 to 5, The pilafter and infide of the archivault.
1 to 4, The impoft.

And the backward divifions,

11 to 3, }
11 to 2, } Are the upper and under part of the key-ftone.

Of Single Pedeftals, Columns, or Entablatures.

If only § a fingle pedeftal, column, or entablature be wanted, we may proceed in the following manner. And firft for the height of the pedeftal.

Fix the leg of the Sector at the beginning of the fifth bar, eighth line, fecond interval, firft face.

The moveable leg carried to the laft divifion No. 4, of that line, marks the entire height of the pedeftal.

Brought back to No. 3, cuts off the bafe; but the height of the dye and cornice is a backward divifion, therefore

4 to 2, Will cut off the cornice, and alfo the dye.

Plate V. Fig. B. The general projections of the pedeftal; firft face, fecond interval, fecond bar, Doric line; where we have the projections of great colonnades: therefore fix the inftrument at No. 1, and carry it to No. 9, and we fhall have the greater half intercolumniation.

1 to 6, The bafe and cornice.

The other is a backward divifion, therefore

9 to 5, Is the dye.

Columns, without entablatures or pedeftals, are placed upon the third interval, fecond bar, firft face; the thirteenth line is the Doric Order.

The fixed leg placed at the beginning of the bar No. 1, and the moveable one carried to the laft divifion No. 4, gives the height of the column; brought back to 3, the bafe; and the legs of the Sector reverfed for the backward divifion, then

4 to 2, Fixes the top of the trunk, and bottom of the capital.

The general projections of the column.

The Sector fixed as in the laft article; then

1 to 9, Is the greater half intercolumniation.

The others are backward divifions, fo that

9 to 2, Is the top of the trunk.
9 to 3, The bottom of the trunk.
9 to 4, The capital.
9 to 5, The bafe.

For the general heights of an entablature only, fix the inftrument at the fixth bar, fecond interval, eighth line, firft face.

1 to 4, Cuts off the entire height.
1 to 3, The architrave.

The

§ See this article fully explained in the Tufcan Order, Page 7, Plate XX. Fig. 1.

The laſt is a backward diviſion, therefore

4 to 2, Cuts off the frieze, and alſo the cornice.

General projections of an entablature only, are on the firſt face, ſecond interval, ſecond bar, Doric line.

The Sector fixed at the beginning of the bar, then

1 to 9, Is the greater half intercolumniation.

1 to 7, The cornice.

The remaining is a backward diviſion, therefore

9 to 2 Cuts off the frieze, and alſo the bottom of the architrave.

Heights and Projections of the MEMBERS.

Thus far the general meaſures of this Order: we will now ſet off the heights and projections of every individual member.

Of the Baſe to the PEDESTAL.

Plate VII. Fig. A. The baſe of the Doric pedeſtal hath it's heights laid down on the ſecond face of the Sector, third interval, ſecond bar, thirty-fourth line.

The Sector being fixed as before,

1 to 6, Cuts off the height of the baſe.

1 to 5, The cavetto.

1 to 4, The fillet.

1 to 3, The cyma reverſa.

1 to 2, The fillet, and alſo the height of the plinth.

Of the Dye of the PEDESTAL.

The half height of the dye of pedeſtals; ſecond face, third interval, ſixth bar, thirty-fourth line.

The Sector opened from the beginning No. 1, to the end of the Doric line No. 2, gives half the height of the dye.

The Cornice of the PEDESTAL.

Cornice of pedeſtals; third interval, third bar, thirty-fourth line.

The Sector opened from the beginning of the bar No. 1, to the laſt diviſion 6, gives the entire cornice of the pedeſtal.

1 to 5, Cuts off the fillet.

1 to 4, The corona.

The remaining numbers are backward diviſions; therefore,

6 to 3, The ovolo.

6 to 2, The fillet, and alſo the cavetto.

Baſe of the COLUMN.

Base of the column; ſecond face, third interval, firſt bar, thirty-fourth line.

One leg of the Sector placed at the beginning of the bar No. 1, the other carried to the laſt diviſion 8, marks the entire height of the baſe.

1 to 7, The height of the lower cincture.
1 to 6, The upper tore.
1 to 5, The upper fillet of cavetto.
1 to 4, The cavetto.
1 to 3, The lower fillet of cavetto.
1 to 2, The lower tore, and alſo the plinth.

Of the CAPITAL.

Fig. B. For the heights of capitals, we muſt take the fourth interval of the ſecond face. The Doric capital is laid down on the firſt bar, thirty-ninth line.

One leg of the Sector fixed at the beginning of it No. 1; the other carried to the laſt diviſion No. 11, gives the entire height.

1 to 10, The fillet.
1 to 9, The Doric cyma.
1 to 8, The corona.
1 to 7, The ovolo.
1 to 6, The firſt annulet.
1 to 5, The ſecond annulet.
1 to 4, The third annulet.

The remaining are backward diviſions, therefore

11 to 3, Gives the neck of the capital.
11 to 2, The upper aſtragal, and alſo the upper cincture.

The next, or ſecond bar of this fourth interval and thirty-ninth line, gives the heights of the Doric architrave and frieze.

Of the ARCHITRAVE and FRIEZE.

Open the Sector as uſual, from the beginning, No. 1, to the laſt diviſion, No. 9, and you have the entire height of both theſe parts.

1 to 8, The top of the channel of the triglyph..
1 to 7, The bottom of it.
1 to 6, The tenia, or band to the architrave.
1 to 5, The lower part of it.
1 to 4, The fillet to the drops.
1 to 3, The drops.
1 to 2, The bottom of the upper faſcia, and alſo the top of the under faſcia.

Of the CORNICE.

Heights of cornices are to be found on the third bar of the fourth interval, thirty-ninth or Doric line; ſecond face.

The Sector being opened from the beginning No. 1, to the laſt diviſion No. 10, gives the entire height.

1 to 9, The fillet.
1 to 8, The cyma.
1 to 7, The fillet.
1 to 6, The Doric cyma.

1 to 5,

1 to 5, The corona.

1 to 4, The ovolo.

1 to 3, The fillet.

The laſt is a backward diviſion.

9 to 2, Gives the height of the cavetto, and band of the triglyph capital.

Projections of the MEMBERS.

These are all the heights of this Order: we ſhall now take in the ſame manner the projections, which are all ſet off from the axis of the column.

Baſe of the PEDESTAL.

Fig. A. And firſt for the baſe of the pedeſtal; ſecond face, third interval, fourth bar, Doric line.

The Sector opened from the beginning No. 1, to the laſt diviſion 6, gives the projection of the plinth.

1 to 5, That of the fillet, and cyma reverſa.

1 to 4, The fillet.

1 to 3, The cavetto.

1 to 2, The projection of the dye.

Cornice of the PEDESTAL.

Projections of cornice to pedeſtals; ſecond face, third interval, fifth bar, Doric line.

The Sector opened from the beginning No. 1, to the laſt diviſion 7, gives the projection of the fillet.

1 to 6, The corona.

1 to 5, The top of the ovolo.

1 to 4, The fillet and bottom of the ovolo.

1 to 3, The cavetto.

1 to 2, The dye.

Baſe of the COLUMN.

Base of the column; ſecond interval, ſecond face, firſt bar, Doric or twenty-ninth line.

The Sector opened from the beginning No. 1, to the laſt diviſion No. 6, gives the projection of the plinth and tore.

1 to 5, The lower fillet to the cavetto.

1 to 4, The upper fillet to the cavetto, and center of upper tore.

1 to 3, The lower cincture.

1 to 2, The greater half diameter of the column.

Of the CAPITAL.

Fig. B. Leſſer half diameter and capital; ſecond face, ſecond interval, ſecond bar, Doric line.

The Sector opened from the beginning of the bar No. 1, to the laſt diviſion 10, contains the projection of the upper fillet.

1 to 9, The top of the Doric cyma.

1 to 8, The bottom of it.

1 to 7, The corona.

1 to 6, The top of the ovolo.

1 to 5, The bottom of the ſame, and the firſt annulet.

1 to 4, The ſecond annulet, and center of the upper aſtragal, and upper cincture.

1 to 3, The third annulet.

1 to 2, The neck of the capital, and leſſer half diameter of the column.

Of the FRIEZE and ARCHITRAVE.

Frieze and architrave; ſecond face, ſecond interval, third bar, Doric line.

The Sector opened as uſual from the diviſion No. 1, to the laſt diviſion No. 13, gives the projection of the band of the triglyph.

1 to 12, The ſide drop and it's fillet.

1 to 11, The top of the drop.

1 to 10, The upper faſcia.

1 to 9, The frieze and lower faſcia.

1 to 8, The capital of the triglyph.

1 to 7, The ſide channel.

1 to 6, The fillet and bottom of the outer drop.

1 to 5, The top of the drop.

1 to 4, The other ſide of the channel, and middle of the drop.

The remaining numbers are backward diviſions, therefore

13 to 3, and 13 to 2, Are the middle of the two other drops, and alſo the ſides of the whole channel.

Of the FRIEZE and CORNICE.

Frieze and cornice; ſecond face, ſecond interval, fourth bar, Doric line.

The Sector opened from 1 to the laſt diviſion 21, gives the fillet of the cyma, or entire projection of the cornice.

1 to 20, The cyma and fillet.

1 to 19, The top of the Doric cyma.

1 to 18, The bottom of it.

1 to 17, The corona.

1 to 16, The tooth of the cornice.

1 to 15, The fillet.

1 to 14, The ovolo.

1 to 13, The fillet.

1 to 12, The cavetto.

1 to 11, The band to the triglyph capital.

1 to 10, The ſide triglyph.

1 to 9, The bottom of it's channel.

1 to 8, The frieze.

1 to 7, The triglyph capital.

1 to 6, and 1 to 5, The half channel.

The remaining numbers are backward diviſions, therefore

21 to 4, The ſide of the whole triglyph.

21 to 3, It's middle.

21 to 2, It's other ſide.

Heights and Projections of IMPOSTS, &c.

THOSE of the imposts are laid down on the second face, first interval; and the heights of those adapted to the lesser arches are marked on the first bar, twenty-fourth or Doric line.

PLATE XVII. The Sector opened from the beginning of the line No. 1, to the last division No. 10, gives the entire height of the impost.

1 to 9, The fillet.
1 to 8, The astragal.
1 to 7, The neck.
1 to 6, The fillet, and bottom of the cyma.
1 to 5, The fillet, and top of the cyma.
1 to 4, The corona.

THEN for the two backward divisions,

10 to 3, The cyma.
10 to 2, The filet.

THE heights of the imposts for greater arches, are on the second face, first interval, second bar, Doric line.

THE Sector opened from the beginning No. 1, to the last division No. 12, gives the entire height.

1 to 11, The fillet.
1 to 10, The astragal.
1 to 9, The neck.
1 to 8, The lower fillet.
1 to 7, The upper fillet, and also the bottom of the ovolo.
1 to 6, The top of the ovolo.
1 to 5, The fillet and bottom of the cyma.

THE remaining numbers are backward divisions; therefore,

12 to 4, The top of the cyma and fillet.
12 to 3, The bottom of the upper cyma.
12 to 2, The top of the cyma, and upper fillet.

Projections of Imposts and Archivaults.

THE projections of imposts are on the first interval of the second face, third and fourth bars; and as archivaults always fall upon the imposts, we shall at the same time, take off the different members belonging to them.

AND first for the lesser imposts and archivaults; third bar, Doric line.

THE Sector opened from the beginning No. 1, to the last division No. 12, gives the entire breadth of the archivault, and projection of the impost.

1 to 11, AND 1 to 10, The cyma.
1 to 9, The corona.
1 to 8, The fillet and cyma.
1 to 7, The fillet and lower cyma, and the lower fillet and center of the astragal.
1 to 6, The neck, and also the pilaster and total width of the archivault.
1 to 5, Cuts off the first fascia of the archivault.

N THEN

Then follow the backward divifions,

12 to 4, Is the fecond fafcia.

12 to 3, The aftragal.

12 to 2, The cyma and fillet.

Projections of greater Impofts and Archivaults.

We next come to the greater impofts and archivaults; fourth bar, Doric line.

The Sector opened from the beginning 1, to the laft divifion 14, gives us the width of the archivault, and entire projection of the impoft.

1 to 13, AND 1 to 12, } The cyma.

1 to 11, The fillet and top of the cyma.

1 to 10, The bottom of the cyma and fillet.

1 to 9, The ovolo.

1 to 8, The bottom of the ovolo, and upper fillet, and alfo the lower fillet and center of the aftragal.

1 to 7, The next fillet.

1 to 6, The pilafter, the neck, and total width of the archivault.

1 to 5, Cuts off the firft fafcia.

1 to 4, The fecond fafcia.

Now for the backward divifions,

14 to 3, The aftragal.

14 to 2, The cyma and it's fillet.

Thus we have the widths or heights of archivaults; the projections of their members are feldom drawn in plans, but yet abfolutely neceffary to be known; they are therefore on the fifth and fixth bars, firft interval, fecond face. See the remark, at the bottom of page 11.

Projections of leffer ARCHIVAULTS.

First, projections of archivaults for the leffer arches; fifth bar, Doric line.

The Sector opened from the beginning No. 1, to the laft divifion 6, gives (as we faid before) the width of the archivault, and it's projection.

1 to 5, AND 1 to 4, } The top and bottom of the cyma.

1 to 3, The fecond fafcia.

1 to 2, The firft fafcia.

Projections of the greater ARCHIVAULTS.

Projections of the archivaults of greater arches; fixth bar, Doric line.

The Sector opened from the firft to the fixth divifion, as before, gives the width and projection of the archivault.

1 to 5, The cyma.

1 to 4, The cyma and aftragal.

1 to 3, The fecond fafcia.

1 to 2, The firft fafcia.

Heights

Heights and Projections of BLOCK CORNICES.

The next thing is block cornices, which are on the fecond face, fecond interval, fifth and fixth bars, Doric line.

First for the heights; fifth bar.

Plate XVIII. The Sector opened from the beginning of the bar 1, to the laft divifion 10, gives the entire height.

1 to 9, The fillet.
1 to 8, The cavetto.
1 to 7, The fillet.
1 to 6, The corona.
1 to 5, The cyma, and top of the modilion.

The remaining numbers are backward divifions, therefore

10 to 4, The bottom of the modilion.
10 to 3, The drops to the modilion.
10 to 2, The top of the cyma, and the fillet.

Projections of the Doric block cornices; fixth bar.

The Sector opened from the beginning 1, to the laft divifion 14, gives the entire projection of the cornice, beyond the upright of the wall.

1 to 13, The cavetto.
1 to 12, The fillet.
1 to 11, The corona.
1 to 10, and 1 to 9, The cyma.
1 to 8, The outward modilion.
1 to 7, and 1 to 6, The cyma.
1 to 5, The inward modilion, and alfo the fillet.

Of the three backward divifions,

14 to 4, Cuts off the top of the lower cyma.
14 to 3, The inward modilion.
14 to 2, The bottom of the lower cyma.

Of BALLUSTERS.

We come next to ballufters, which are on the firft face, fourth interval, fifth and fixth bars, Doric line.

Heights of ballufters; fifth bar.

Plate XIX. The Sector opened from the beginning 1, to the laft divifion 16, gives us the entire height.

1 to 15, The upper fillet.
1 to 14, The ovolo.
1 to 13, The fillet.
1 to 12, The neck.
1 to 11, The aftragal.
1 to 10, The fillet.

1 to 9, Gives the line on which the greateſt projection of the vaſe is to be marked; but this diviſion is of no other uſe in the heights, and therefore marked with a croſs on the bar.

1 to 8, The bottom of the vaſe.

1 to 7, The lower aſtragal.

1 to 6, The ovolo.

1 to 5, The fillet.

THEN for the three backward diviſions,

16 to 4, The cavetto.

16 to 3, The fillet.

16 to 2, The ovolo, and alſo the plinth.

PROJECTIONS of balluſters; ſixth bar.

N. B. The manner of ſetting off the projections of balluſters is fully explained in page 13.

THE Sector opened from the beginning of the bar No. 1, to the laſt diviſion 8 on the Doric line, gives the projection of the entire balluſter. From

1 to 7, The lower ovolo, and utmoſt projection of the vaſe.

1 to 6, The upper ovolo and fillet.

1 to 5, The middle ovolo, the lower fillet, the upper ovolo and fillet.

1 to 4, The upper aſtragal, and the ſecond fillet.

1 to 3, The cavetto, the lower aſtragal, and fillet to the upper aſtragal.

1 to 2, The top of the vaſe and neck.

Flutes of COLUMNS in Plano.

PLATE VI. We have now given an example of every thing to be drawn in this Order, except flutes, and doors with their ornaments.

DORIC flutes in plano; are on the firſt face, twenty-ſecond line, firſt bar.

HALF the plan of the column being drawn, and therein the ſemi-diameter D R at right angles with the diameter C B, we ſhall divide it into two quadrants: take in your compaſſes the chord B D of one entire quadrant, and apply this diſtance to the Sector opened as before, and try on what oppoſite numbers this opening will coincide; and then from this number thus diſcovered, we ſet off the Doric flutes.

THE Sector opened from the beginning 1 to the laſt diviſion 7, gives one fourth part of the circumference, viz. C D or B D.

1 to 6, Being ſet from B and D, gives the flutes 2 and 7.

1 to 5, From the ſame points, the flutes 3 and 6.

1 to 4, Is the radius R D, or ſemi-diameter.

1 to 3, The flutes 4 and 5,

1 to 2, Biſects the quadrant at A.

Upright FLUTES.

DORIC upright flutes; ſecond bar, twenty-ſecond line.

OPEN the Sector from the beginning No. 1, to the laſt diviſion 8, then take the ſemi-diameter of the column, and apply this diſtance to oppoſite numbers until it coincides therewith; and from this number ſo diſcovered we ſet off all the flutes from the center line of the column each way.

1 to 7,

1 to 7, The ſide of the half flute.

1 to 6,
1 to 5,
1 to 4,
AND
1 to 3, } The flutes in their order.

The other being a backward diviſion, therefore

8 to 2, Obtains the half flute.

Of DOORS.

Plate XX. Fig. 3. After having drawn the Doric Order as laid down on the firſt face, firſt interval; one leg of the Sector fixed at the beginning the Doric line 1, let the other be opened to 12, marked d upon the limb, then we ſhall cut off the height of the doors proportioned to colonnades without pedeſtals; 1 to 9 marked alſo d, cuts off the heights of doors proportioned to colonnades with pedeſtals. But if only a door is to be drawn, then this ſcale is of no uſe, becauſe the height or width of the door being arbitrary, we need only to have a reference to them.

Heights of doors, and their entablatures; firſt face, third interval, firſt bar, Doric line.

Having determined either the heights, widths, or half widths of a door intended to be drawn, fix one leg of the Sector at the beginning of the bar, and open the other leg to any one of thoſe given lengths, ſuppoſe the half width K M, then the meaſure of that taken in the compaſſes muſt be applied to the Sector, and where the legs of it coincide upon oppoſite numbers will give the proper heights of doors.

The moveable leg of the Sector carried to the laſt diviſion of the line 12, gives the entire height of the door with it's entablature.

1 to 11, Cuts off the cornice.
1 to 9, The frieze.
1 to 8, The architrave, and conſequently the height of the door without the entablature.
1 to 3, The width of the door.
1 to 2, The half width K M, which we began with.

If we make uſe of a kneed architrave, then after taking

1 to 8, The height of the door,
1 to 5, Gives the depth of the knee.

If a conſole is to be added to it, it is generally made to ſupport the cornice, and to terminate with the bottom of the knee, with a leaf falling from it; therefore

1 to 11, Gives the top of the conſole.
1 to 9, The bottom of the upper volute.
1 to 10, The eye of the upper volute.
1 to 7, The top of the lower volute.
1 to 6, The eye of the lower volute.
1 to 5, The bottom of the lower volute.
1 to 4, Cuts off the length of the leaf.

Having thus got the general heights of entablatures and conſoles to doors, we now come to the particular mouldings, which we will deſcribe at large; they are on the firſt face, fourth interval, firſt bar, Doric line.

Heights of entablature of doors; firſt bar.

PLATE XXII. The Sector opened from the beginning 1 to the laſt diviſion 15, is the entire entablature.

1 to 14, Cuts off the fillet.
1 to 13, The cyma.
1 to 12, The fillet.
1 to 11, The cyma.
1 to 10, The corona.
1 to 9, The ovolo.
1 to 8, The fillet.
1 to 7, The cyma, and alſo the entire cornice.
1 to 6, The frieze.
1 to 5, The fillet.
1 to 4, The cyma.
1 to 3, The aſtragal.

THE backward diviſion,

15 to 2, Gives the upper faſcia.

PROJECTIONS of cornice of doors; ſecond bar.

THE Sector opened from the beginning 1 to the laſt diviſion 10, is the greateſt projection of the cornice.

1 to 9, The cyma, and alſo the fillet.
1 to 8, AND 1 to 7, The cyma.
1 to 6, The corona.
1 to 5, The ovolo.

THE backward diviſions,

10 to 4, Cuts off the bottom of the ovolo, and fillet.
10 to 3, AND 10 to 2, The lower cyma.

PROJECTIONS of architraves of doors; third bar.

As the entire projections of architraves are too ſmall to be laid down by themſelves on the ſcale, we are obliged here, as in archivaults, to add ſome certain meaſure before them, for which purpoſe we chooſe to repeat the height of the architrave itſelf.

THE Sector opened from the beginning 1 to the laſt diviſion 6, gives us both the height and projection of the architrave.

1 to 5, AND 1 to 4, The cyma, and alſo the aſtragal.
1 to 3, The upper faſcia.
1 to 2, The lower faſcia.

Of CONSOLES.

PLATE XXIII. Theſe, like the architraves, contain too ſmall a ſpace to be laid down by themſelves; but as the conſole is generally placed by the ſide of the architrave, we add the height of the architrave itſelf.

THE half heights of conſoles are laid down on the firſt face, ſecond interval, ſeventh bar, Doric line.

PLATE

PLATE XXIII. The Sector opened from the beginning No. 1, to the laſt diviſion 7, gives half the entire height ; from

1 to 6, The eye of the upper volute.
1 to 5, The bottom of the upper volute.
1 to 4, The top of the lower volute.
1 to 3, The eye of it.
1 to 2, The bottom of the volute, and top of the leaf.

WIDTH of conſoles ; firſt face, fourth interval, fourth bar, Doric line.

1 to 7, Gives the entire width of the architrave and conſole.
1 to 6, The fillet.
1 to 5, The cyma.
1 to 4, The aſtragal.
1 to 3, The cyma.
1 to 2, The other fillet.

The USE of the ARCHITECTONIC SECTOR, In drawing the IONIC ORDER.

GENERAL HEIGHTS.

CHAP. IV.

FOR the general heights, &c. of the ancient Ionic Order. They are upon the firſt face of the limb, firſt interval, third bar.

Plate VIII. Screw one leg of the Sector to the beginning of the third line, No. 1, then move the other till it cuts the laſt diviſion 17, which is the total height of the Order.

Bring the moveable leg back to 16, this cuts off the baſe of the pedeſtal.

1 to 15, The dye.
1 to 14, The cornice.
1 to 13, The baſe of the column.

Then paſſing over the diviſions marked with letters, which belong to doors or arches, bring the moveable leg from

1 to 5, The trunk.
1 to 4, The capital.
1 to 3, The architrave.
1 to 2, The frieze, and alſo the modilion cornice.

The moveable leg brought to 14, gives the height of the column with it's entablature, without a pedeſtal.

In like manner the moveable leg brought to 4, cuts off the entablature without a column.

Of INTERCOLUMNIATIONS.

First face, ſecond interval, firſt and ſecond bars, ninth line.

These bars gives us, beſides the projections of the column, and entablature, two different intercolumniations, one of one module, thirty-ſeven minutes, 1-4th; the other of one module, twenty-one minutes, 1-4th.

We ſhall begin with the firſt bar.

The

THE Sector opened from the beginning of the bar No. 1, (which anſwers to the axis of the column) to the laſt diviſion No. 8, we ſhall have the greater half intercolumniation.

1 to 7, The leſſer half intercolumniation.
1 to 6, The projection of the cornice.

THE remaining numbers are backward diviſions; therefore,

9 to 5, Gives the projection of the plinth of the column.
9 to 4, The capital.
9 to 3, The greater half diameter.
9 to 2, The leſſer half diameter.

THE Ionic column with pedeſtals, and two intercolumniations, one of four modules and ten minutes, the other of one module, thirty-ſeven minutes and a quarter.

SECOND bar, ſecond interval, ninth line.

THE Sector opened from the beginning of the bar No. 1, to the laſt diviſion 9, marks the greater half intercolumniation.

1 to 8, The leſſer half intercolumniation.
1 to 7, The projection of the cornice.
1 to 6, The plinth, and cornice of the pedeſtal.

THE remaining numbers are backward diviſions; therefore

9 to 5, The plinth, and baſe of the column.
9 to 4, The projection of the capital.
9 to 3, The greater half diameter.
9 to 2, The leſſer half diameter.

Of ARCHES.

THE heights of arches are on the firſt interval, and the third or Ionic line; this we have already done in the intercolumniations, and as far as relates to the Order itſelf: but upon the ſame line, there are ſeveral diviſions marking the heights of arches, &c. which were omitted in forming colonnades, but become at preſent neceſſary.

OPEN the Sector from the beginning of the Ionic or third line No. 1, to 6, marked k, this gives the bottom of the key-ſtone to the leſſer arch.

1 to 7 k, The bottom of the key-ſtone to the greater arch.
1 to 8 i, Top of the impoſt to the leſſer arch.
1 to 10 i, Bottom of the impoſt to the leſſer arch, and top of that to the greater arch.
1 to 12 i, Fixes the bottom of the impoſt to the greater arch.

PROJECTIONS of greater arches.

OPEN the Sector to the beginning of the Ionic or ninth line, ſecond interval, third bar, firſt face, to the laſt diviſion; then 1 anſwers to the middle of the arch, and 11 cuts off the cornice to the greater arch.

1 to 10, The capital.
1 to 9, The top of the trunk.
1 to 8, The axis of the column.
1 to 7, The bottom of the trunk, and alſo the outſide of the archivault.
1 to 6, The dye, and alſo the plinth of the column.
1 to 5, The plinth and cornice of the pedeſtal, the pilaſter, and conſequently the inſide of the archivault.
1 to 4, The impoſt.

THE remaining are backward divifions; therefore

11 to 2, AND 11 to 3, } Cut off the top and bottom of the key-ftone.

PROJECTTIONS of Ionic leffer arch are on the fecond interval, third bar, ninth or Ionic line, firft face.

OPEN the Sector to the beginning No. 1, to No. 12, then 1 anfwers to the middle of the arch, and 12 is the projection of the cornice.

1 to 11, The capital.
1 to 10, The top of the trunk.
1 to 9, The axis of the column.
1 to 8, The bottom of the trunk.
1 to 7, The outfide of the archivault.
1 to 6, The bafe of the column.
1 to 5, The pilafter, and alfo the infide of the archivault.
1 to 4, The impoft.

THE remaining are backward divifions,

12 to 2, AND 12 to 3, } For the top and bottom of the key-ftone.

Of a Single Pedeftal, Column, or Entablature.

§ A fingle pedeftal is on the firft face, fecond interval, fifth bar, ninth line.

THE Sector being fixed as before, and the moveable leg carried to the laft divifion 4, gives the entire height of the pedeftal; brought back to 3 cuts off the bafe. No. 2 is a backward divifion, therefore from 4 to 2 gives the height of the cornice, and alfo the dye.

PLATE VIII. The general projections of pedeftals; firft face, fecond interval, fecond bar, Ionic line.

FIX the inftrument at the beginning No. 1, and carry the other limb of it to 9, which cuts off the greater half intercolumniation; from

1 to 6, The bafe, and alfo the cornice.

AND the backward divifion,

9 to 5, Is the dye.

THE heights of a fingle column are on the firft face, fecond interval, fecond bar, fourteenth line.

THE Sector placed at No. 1, then carried to the laft divifion 4, gives the entire height; brought back to 3 the bafe; and the legs of the inftrument reverfed for the backward divifion, then 4 to 2 fixes the top of the trunk, and the bottom of the capital.

THE general projections of the column, are on the firft face, third interval, fecond bar, Ionic line.

THE Sector being fixed as before; then

1 to 9, Is the greater half intercolumniation.

THE remainder are backward divifions; therefore

9 to 2, The top of the trunk.
9 to 3, The bottom of the trunk.
9 to 4, The capital.
9 to 5, The bafe.

THE heights of an entablature; firft face, fecond interval, fixth bar, Ionic line.

1 to 4, The entire height.
1 to 3, The architrave.
1 to 2, The frieze, and alfo the cornice.

PROJECTIONS

§ See Plate XX, Page 6.

PROJECTIONS of the entablature; firſt face, ſecond interval, ſecond bar.

1 to 9, Is the greater half intercolumniation.
1 to 7, The cornice.

AND the backward diviſion,

9 to 2, Cuts off the frieze and architrave.

Of the MEMBERS.

WE ſhall begin with the baſe of the pedeſtal; the heights of which are laid down on the ſecond face, third interval, ſecond bar, thirty-fifth line.

The PEDESTAL.

PLATE X. One leg of the Sector placed at the beginning as uſual, and the other at the end of the bar; then

1 to 7, Cuts off the height of the baſe.
1 to 6, The cavetto.
1 to 5, The fillet.
1 to 4, The aſtragal.
1 to 3, The cyma reverſa.
1 to 2, The fillet, and alſo the plinth.

THE half heights of the dye of pedeſtals; ſecond face, third interval, ſixth bar.

THE Sector opened from the beginning 1, to the end of the Ionic line, gives half the height of the dye.

CORNICE of pedeſtals; third bar, thirty-fifth line.

THE Sector opened from the beginning of the bar No. 1, to the laſt diviſion 7, gives the entire cornice of the pedeſtal.

1 to 6, The fillet.
1 to 5, The corona.

THE remaining numbers are backward diviſions; therefore

7 to 4, Gives the bottom of the ovolo.
7 to 3, The aſtragal.
7 to 2, The fillet, and alſo the cavetto.

The COLUMN.

BASE of the column; ſecond face, third interval, firſt bar, thirty-fifth line.

ONE leg of the Sector placed at the beginning of the bar No. 1, and the other carried to the laſt diviſion No. 9, marks the entire height of the baſe.

1 to 8, The lower cincture.
1 to 7, The lower aſtragal.
1 to 6, The upper tore.
1 to 5, The upper fillet of the ſcotia.
1 to 4, The ſcotia.
1 to 3, The lower fillet.
1 to 2, The lower tore, and alſo the plinth.

The CAPITAL.

FIG. B. For the heights of the ancient Ionic capital and entablature, we muſt take the fourth interval of the ſecond face.

The Ionic capital is laid down on the firſt bar, fortieth line.

One leg of the Sector fixed to the beginning of the bar No. 1, the other carried to the laſt diviſion No. 11, gives the entire height; and 1 is the bottom of the volute.

1 to 10, The fillet.
1 to 9, The Doric cyma.
1 to 8, The lift of the volute.
1 to 7, The ovolo, and top of the ſecond revolution.
1 to 6, The aſtragal, and top of the eye.
1 to 5, The center of the eye of the volute.
1 to 4, The bottom of the aſtragal, and bottom of the eye.

The remaining numbers are backward diviſions, therefore

12 to 3, Is the upper cincture.
12 to 2, The height of another revolution of the volute.

Fig. C. The heights of the modern Ionic capital and entablature, are laid down on the ſixth line of the fourth interval, firſt bar, ſecond face, and forty-third line.

One leg of the Sector ſet to the beginning of the bar, the other carried to the laſt diviſion No. 11, gives the entire height; and 1 is the bottom of the volute.

1 to 10, The fillet.
1 to 9, The Doric cyma.
1 to 8, The band of the volute, the ovolo, and the ſecond revolution.
1 to 7, Another revolution.
1 to 6, The top of the aſtragal, and the top of the eye of the volute.
1 to 5, The center of the eye.
1 to 4, The bottom of the aſtragal, and of the eye.

The remaining numbers are backward diviſions, therefore

11 to 3, The upper cincture.
11 to 2, Another revolution.

Of the ARCHITRAVE and FRIEZE.

The ſecond bar of the fourth interval, and fortieth line of the ſecond face, gives the heights of the ancient Ionic architrave and frieze.

Fig. B. The Sector opened as uſual from the beginning of the bar No. 1 to the laſt diviſion 9, marks the entire height of both theſe parts.

1 to 8, The top of the architrave.
1 to 7, The fillet.
1 to 6, The Doric cyma.
1 to 5, The upper faſcia.
1 to 4, The aſtragal.

The remaining numbers are backward diviſions, therefore

9 to 3, The middle faſcia.
9 to 2, The aſtragal, and alſo the lower faſcia.

The heights of the modern Ionic architrave, and frieze are upon the ſecond bar of the ſixth line, fourth interval.

Fig. C.

Fig. C. The Sector opened from the beginning of the second bar No. 1 on the forty-third line, to the last division No. 9, is the entire height of both these parts.

1 to 8, The frieze.
1 to 7, The fillet.
1 to 6, The Doric cyma.
1 to 5, The upper fascia.
1 to 4, The astragal.

The remaining numbers are backward divisions, therefore

9 to 3, The middle fascia.
9 to 2, The astragal and lower fascia.

Of the CORNICE.

Heights of ancient Ionic cornices are to be found on the third bar of the fourth interval, fortieth line.

Fig. B. The Sector opened from the beginning No. 1 to the last division 12, shews the entire height;

1 to 11, The fillet.
1 to 10, The cyma.
1 to 9, The fillet.
1 to 8, The Doric cyma.
1 to 7, The corona.
1 to 6, The ovolo.
1 to 5, The fillet.
1 to 4, The dental band.

The remaining numbers are backward divisions; therefore

12 to 3, The dentals.
12 to 2, The fillet, and Doric cyma.

The heights of the modern Ionic cornice is laid down on the third bar of the forty-third line.

Fig. C. The Sector opened from the beginning No. 1 to the last division 12, shews the entire height.

1 to 11, The fillet.
1 to 10, The cyma.
1 to 9, The fillet.
1 to 8, The Doric cyma.
1 to 7, The corona.
1 to 6, The Doric cyma.
1 to 5, The modilions.
1 to 4, The fillet.

The remaining numbers are backward divisions; therefore

12 to 3, The ovolo.
12 to 2, The fillet and cavetto.

These are all the heights of the Ionic Order; we shall now take in the same manner the projections, which are all set off from the axis of the column.

The PEDESTAL.

And first for the base of the pedestals; second face, third interval, fourth bar, Ionic line.

The Sector opened from the beginning 1 to the last division 7, gives the projection of the plinth.

1 to 6,

1 to 6, The fillet.
1 to 5, The aſtragal.
1 to 4, The fillet.
1 to 3, The cavetto.
1 to 2, The dye.

PROJECTIONS of cornice of pedeſtals; ſecond face, third interval, fifth bar, Ionic line.

THE Sector opened from the beginning No. 1 to the laſt diviſion No. 8, gives the projection of the upper fillet.

1 to 7, The corona.
1 to 6, The ovolo.
1 to 5, The aſtragal.
1 to 4, The fillet.
1 to 3, The cavetto.
1 to 2, The dye.

BASE of the column; ſecond face, ſecond interval, firſt bar.

THE Sector opened from the beginning No. 1 to the laſt diviſion 6, gives the projection of the plinth and tore.

1 to 5, The lower fillet.
1 to 4, The upper fillet of the ſcotia, and center of the upper tore; alſo the lower aſtragal.
1 to 3, The lower cincture.
1 to 2, The greater half diameter of the column.

LESSER half diameter, and ancient capital; ſecond face, ſecond interval, ſecond bar, Ionic line.

THE Sector opened from the beginning of the bar No. 1 to the laſt diviſion No. 10, contains the utmoſt projection of the volute.

1 to 9, The ſecond revolution.
1 to 8, The fillet.
1 to 7, The top of the Doric cyma, and another revolution.
1 to 6, The bottom of the cyma.
1 to 5, The eye of the volute.
1 to 4, The top of the trunk of the column.
1 to 3, The third revolution.
1 to 2, The inſide of the volute.

LESSER half diameter, and modern capital; ſecond face, forty-third line, fourth bar.

THE Sector opened from the beginning of the bar No. 1, to the laſt diviſion 13, gives the projection of the fillet and volute.

1 to 12, AND 1 to 11, } The Doric cyma.
1 to 10, The fillet, and firſt revolution.
1 to 9, AND 1 to 8, } The Doric cyma.
1 to 7, The ſecond revolution.
1 to 6, The third revolution.

1 to 5,

1 to 5, The eye of the volute.
1 to 4, Another revolution.
1 to 3, The infide of the volute.

The remaining number is a backward divifion; therefore,

13 to 2, Is the beginning of the volute.

Of the FRIEZE and ARCHITRAVE.

Frieze and architrave; fecond face, fecond interval, third bar, Ionic line.

The Sector opened as ufual from the divifion No. 1 to the laft divifion 7, gives the utmoft projection of the fillet.

1 to 6, The top of the Doric cyma.
1 to 5, The bottom of it.
1 to 4, The upper fafcia, and aftragal.
1 to 3, The middle fafcia, and aftragal.
1 to 2, The frieze.

Of the FRIEZE and CORNICE.

Frieze and cornice; fecond face, fecond interval, fourth bar, Ionic line.

The Sector opened from the beginning 1 to the laft divifion 17, gives the projection of the fillet, or entire cornice.

1 to 16, The cyma, and alfo the fillet.
1 to 15, The top of the Doric cyma.
1 to 14, The bottom of it.
1 to 13, The corona.
1 to 12, The tooth of the corona.
1 to 11, The fillet to the ovolo.
1 to 10, The ovolo.
1 to 9, The fillet.
1 to 8, The firft dental.
1 to 7, The cyma.
1 to 6, The next dental and Doric cyma.
1 to 5, The frieze.

The remaining numbers are backward divifions; therefore

17 to 4, Is one fide of the fifth dental.
17 to 3, The other fide of it.
17 to 2, One fide of the middle dental, and alfo a denticle.

N. B. From the dentals already drawn the others are to be taken, and alfo the denticles.

Modern FRIEZE and CORNICE.

N. B. The frieze and architrave are the fame as in the ancient Order.

The cornice; fecond face, forty-third line, fifth bar.

The Sector opened as ufual from the divifion 1 to the laft divifion 20, gives the projection of the fillet, or entire cornice.

1 to 19, The bottom of the cyma, and alfo the fillet.
1 to 18, and 1 to 17, } The Doric cyma.
1 to 16, The corona.

1 to 15, AND 1 to 14, } The Doric cyma.

1 to 13, The modilion.

1 to 12, The tooth of the modilion.

1 to 11, AND 1 to 10, } The cyma to modilion.

1 to 9, The modilion and fillet to the ovolo.

1 to 8, The ovolo.

1 to 7, The fillet.

1 to 6, The cavetto.

1 to 5, The frieze.

The remainder are backward divifions.

20 to 2, The fide of the middle modilion.

20 to 3, AND 20 to 4, } It's cyma.

Of IMPOSTS.

The heights and projections of impofts are laid down on the fecond face, firft interval; and the heights of thofe adapted to the leffer arches are marked on the firft bar, twenty-fifth or Ionic line.

Plate XVII. The Sector opened from the beginning of the line No. 1 to the laft divifion 10, gives the entire height of the impoft.

1 to 9, The fillet.

1 to 8, The aftragal.

1 to 7, The fillet, and bottom of the cyma.

1 to 6, The fillet, and top of the cyma.

1 to 5, The ovolo.

1 to 4, The corona.

Then for the two backward divifions,

10 to 3, The Doric cyma.

10 to 2, The fillet.

The heights of the impofts for greater arches are on the fecond face, firft interval, fecond bar, Ionic line.

Plate XVII. The Sector opened from the beginning No. 1 to the laft divifion 12, gives the entire height.

1 to 11, The aftragal.

1 to 10, The neck.

1 to 9, The fillet.

1 to 8, The ovolo.

1 to 7, The fillet.

1 to 6, The cyma.

1 to 5, The fillet.

1 to 4, The corona.

The remaining are backward divifions; therefore

12 to 3, The Doric cyma.

12 to 2, The fillet.

The

The projections of these imposts are on the first interval of the second face, third and fourth bars. And as archivaults always fall upon the imposts, we shall at the same time take off the different members belonging to them.

And first for the lesser imposts and archivaults; third bar, Ionic line.

The Sector opened from the beginning No. 1 to the last division No. 14, gives the entire breadth of the archivault, and projection of the imposts.

1 to 13, and 1 to 12, The Doric cyma.
1 to 11, The corona.
1 to 10, The ovolo.
1 to 9, The fillet.
1 to 8, The center of the astragal and fillet.
1 to 7, The lower fascia, bottom of the cyma, and neck.
1 to 6, The astragal.
1 to 5, The upper fascia.

Then for the backward divisions,

14 to 4, The astragal.
14 to 3, The Doric cyma.
14 to 2, The fillet.

We come next to the greater imposts and archivaults; fourth bar, Ionic line.

The Sector opened from the beginning 1 to the last division 16, gives us the width of the archivault, and entire projection of the impost.

1 to 15, and 1 to 14, The Doric cyma.
1 to 13, The corona.
1 to 12, The fillet and cyma.
1 to 11, The bottom of the cyma and fillet.
1 to 10, The ovolo.
1 to 9, The fillet and center of the astragal.
1 to 8, The bottom of the ovolo and fillet.
1 to 7, The lower fascia, the neck, and also the pilaster.
1 to 6, The astragal.
1 to 5, The upper fascia.

The remaining numbers are backward divisions, therefore

16 to 4, The astragal.
16 to 3, The Doric cyma.
16 to 2, The fillet.

Of ARCHIVAULTS.

Projections of archivaults for the lesser arches; fifth bar, Ionic line.

The Sector opened from the beginning No. 1 to the last division 6, gives, as we said before, the width of the archivault, and it's projection.

1 to 5, The Doric cyma.
1 to 4, It's bottom, and also the astragal.
1 to 3, The second fascia.
1 to 2, The first fascia.

Projections of the archivaults of greater arches; ſixth bar, Ionic line.

The Sector opened from the firſt to the laſt diviſion 6, as before, gives the width and projection of the archivault.

1 to 5, The Doric cyma.
1 to 4, It's bottom, and the aſtragal.
1 to 3, The ſecond faſcia, and aſtragal.
1 to 2, The firſt faſcia.

Of BLOCK CORNICES.

Heights of block cornices; ſecond face, ſecond interval, fifth bar.

Plate XVIII. The Sector opened from the beginning 1 to 12, gives the entire height.

1 to 11, The fillet.
1 to 10, The cyma.
1 to 9, The corona.
1 to 8, The ovolo.
1 to 7, The fillet.
1 to 6, The dentals.
1 to 5, The denticle.

The remaining numbers are backward diviſions, therefore

12 to 4, The bottom of the dentals.
12 to 3, The aſtragal.
12 to 2, The fillet.

Projections of block cornices; ſixth bar.

The Sector opened from the beginning 1 to the laſt diviſion 9, gives the entire projection of the cornice, beyond the upright of the wall.

1 to 8, The cyma.
1 to 7, The corona.
1 to 6, The ovolo.
1 to 5, The fillet.
1 to 4, The dental.

Of the two backward diviſions,

9 to 3, The inſide of the dental, and center of the aſtragal.
9 to 2, The fillet.

Of BALLUSTERS.

Ballusters are on the firſt face, fourth interval, fifth and ſixth bars, Ionic line.

Plate XIX. Heights of balluſters; fourth interval, fifth bar.

The Sector opened from the beginning 1 to the laſt diviſion 18, gives the entire height.

1 to 17, The fillet.
1 to 16, The ovolo.
1 to 15, The fillet, and top of the neck.
1 to 14, The bottom of the neck.
1 to 13, The fillet.
1 to 12, The fillet.
1 to 11, The inverted ovolo.
1 to 10, The fillet, and top of the vaſe.

1 to 9,

1 to 9, The bottom of the vafe.
1 to 8, The fillet.
1 to 7, The aftragal or tore.
1 to 6, The fillet, and top of the cavetto.

The remaining numbers are backward divifions,

18 to 5, The bottom of the cavetto.
18 to 4, The fillet.
18 to 3, The cyma.
18 to 2, The fillet and plinth.

Projections of ballufters; fixth bar.

The Sector opened from the beginning 1 to the laft divifion 12, on the Ionic line, gives the projection of the entire ballufter; which put on paper we bifect, and this bifection gives the femi-diameter of the entire ballufter, which could not be laid down upon the limb.

1 to 11, The plinth and upper fillet.
1 to 10, The lower fillet.
1 to 9, The fillet to the top of the vafe.
1 to 8, A fillet, and the ovolo.
1 to 7, The fillet to the bottom of the cavetto.
1 to 6, The top of the vafe.
1 to 5, The fillet, and top of the neck.
1 to 4, The aftragal or tore.
1 to 3, It's two fillets.
1 to 2, The bottom of the vafe.

Of FLUTES.

Flutes and fillets of columns in plano are on the twenty-fecond line of the firft face, third bar.

N. B. See the manner of taking off the Doric flutes, page 28.

Plate VI. Fig. 1. The Sector opened from the beginning 1 to the laft divifion 10, gives one fourth part of the circumference of the column.

1 to 9, Two half flutes.
1 to 8, Two fillets.
1 to 7, Two flutes.
1 to 6, Two fillets.
1 to 5, The radius marked R.
1 to 4, Two flutes.
1 to 3, Two fillets, and the middle flute.
1 to 2, Half the quadrant A R.

Fig 2. Flutes and fillets for upright columns are on the fourth bar, twenty-fecond line.

The Sector opened from the beginning No. 1 to the laft divifion 14; then we take the femi-diameter of the column, and try on what oppofite numbers it coincides; and from this number fo difcovered, we fet off all the flutes and fillets from the center line each way.

1 to 13, The half flute.
1 to 12, The fillet.

1 to 11, The flute.
1 to 10, The fillet.
1 to 9, The flute.
1 to 8, The fillet.
1 to 7, The flute.
1 to 6, The fillet.
1 to 5, The flute.
1 to 4, The fillet.

Then the two backward divifions are fet from each fide of the column towards the center line.

14 to 3, The flute.
14 to 2, The fillet, and one half of the middle flute.

Flutes and fillets for pilafters are on the fifth bar, twenty-fecond line.

The Sector opened from the beginning No. 1 to the laft divifion 9, and the extent of the half breadth of the pilafter fitted to coincide on oppofite numbers; it is from this number fo difcovered that we fet off the flutes and fillets each way from the middle line of the pilafter.

1 to 8, The flute.
1 to 7, The fillet.
1 to 6, The flute.
1 to 5, The fillet.

Then the two backward divifions are fet off from the fides of the pilafter, towards the middle.

9 to 3, The fillet.
9 to 2, One half of the the middle flute.

Of DOORS.

After having drawn the Ionic Order, as laid down on the firft face, firft interval; one leg of the Sector placed at the beginning of the line 1, let the other be opened to 11, marked d upon the limb, then we fhall cut off the height of doors proportioned to colonnades without pedeftals; 1 to 9 marked alfo d cuts off the heights of doors proportioned to the colonnades with pedeftals.

These two divifions 9 and 11 were not mentioned when we were drawing the heights of the Order, being of no ufe except for the purpofe mentioned.

Heights of doors and their entablatures; firft face, third interval, firft bar, Ionic line.

Having determined either the height, width, or half width of a door intended to be drawn, fix one leg of the Sector at the beginning of the bar, and open the other to any one of thofe given lengths, fuppofe the half width; then the meafure of that taken in the compaffes from the fcale the plan is drawn by, muft be applied to the Sector, and where it coincides upon two oppofite numbers, will become the proper fcale for the general heights of doors.

The moveable leg of the Sector carried to the laft divifion 12, of the line, gives the entire height of the door with it's entablature.

1 to 11, Cuts off the cornice.
1 to 9, The frieze.
1 to 8, The architrave, and confequently 1 to 8 is the height of the door, without the entablature.
1 to 3, The width of the door.
1 to 2, The half width, which we began with.

If

If we make uſe of a kneed architrave, after taking

1 to 8, The height of the door.
1 to 5, Gives the depth of the knee.

If a conſole is to be added, it is generally made to ſupport the cornice, and to terminate with the bottom of the knee with a leaf from it; therefore

1 to 11, Gives the top of the conſole.
1 to 10, The eye of the upper volute.
1 to 7, The top of the lower volute.
1 to 6, The eye of the lower volute.
1 to 5, The bottom of the lower volute.
1 to 4, Cuts off the length of the leaf.

Having thus got the general height of the entablature of doors, we now come to the particular mouldings; which are on the firſt face, fourth interval.

Heights of entablature of doors; firſt bar, Ionic line.

The Sector opened from the beginning 1 to the laſt diviſion 18, is the entire entablature.

1 to 17, Cuts off the fillet.
1 to 16, The cyma.
1 to 15, The fillet.
1 to 14, The cyma.
1 to 13, The corona.
1 to 12, The ovolo.
1 to 11, The fillet.
1 to 10, The dentals.
1 to 9, The fillet.
1 to 8, The cyma and alſo the frieze.
1 to 7, The fillet and bottom of the frieze.
1 to 6, The fillet.
1 to 5, The cyma.
1 to 4, The aſtragal.
1 to 3, The upper faſcia.

The remaining number is a backward diviſion; therefore,

18 to 2, Gives the cyma, and top of the lower faſcia.

Projections of the cornice of doors; ſecond bar.

The Sector opened from the beginning 1 to the laſt diviſion 12, is the greateſt projection of the cornice.

1 to 11, The fillet.
1 to 10, and 1 to 9, The cyma.
1 to 8, The corona.
1 to 7, The ovolo.
1 to 6, The fillet.
1 to 5, The dentals.

The remaining numbers are backward diviſions; therefore

12 to 4, The fillet.
12 to 3, and 12 to 2, The cyma.

Projections of architraves of doors, are on the third bar, Ionic line.

The Sector opened from the beginning 1 to the laſt diviſion 8, gives us both the height and projection of the architrave.

1 to 7, and 1 to 6, The cyma, and alſo the aſtragal.
1 to 5, The upper faſcia.
1 to 4, and 1 to 3, The cyma.
1 to 2, The frieze and lower faſcia.

Of CONSOLES.

Half heights of conſoles; firſt face, ſecond interval, ſeventh bar, Ionic line.

Plate XXIII. The Sector opened from the beginning 1 to the laſt diviſion 7, gives half the entire height.

1 to 6, The eye of the upper volute.
1 to 5, The bottom of it.
1 to 4, The top of the lower volute.
1 to 3, The eye of it.
1 to 2, The bottom of the lower volute, and alſo the top of the leaf.

Widths of conſoles; firſt face, fourth interval, fourth bar, Ionic line.

1 to 9, Gives the total width of the architrave and conſole.
1 to 8, The fillet.
1 to 7, The cyma.
1 to 6, The fillet.
1 to 5, The aſtragal.
1 to 4, The fillet.
1 to 3, The cyma.
1 to 2, The fillet.

The

The USE of the ARCHITECTONIC SECTOR, In drawing the CORINTHIAN ORDER.

CHAP. V.

The Uſe of the Inſtrument in drawing the Corinthian Order, through all it's different Applications.

WE ſhall begin with the general heights of this Order; which are upon the firſt face of the limb, firſt interval, fourth line.

SCREW one leg of the Sector to No. 1, the beginning of the fourth line, then move the other till it cuts the laſt diviſion 17; this is the total height of the Order.

BRING back the moveable leg to 16, this cuts off the baſe of the pedeſtal.

1 to 15, The dye.

1 to 14, The cornice of the pedeſtal.

1 to 13, The baſe of the column.

THEN paſſing over the diviſions marked with letters, which belong to doors or arches, bring the moveable leg from

1 to 7, The trunk.

HERE likewiſe paſs by No. 6 and 5, both marked with letters, and bring the moveable leg from

1 to 4, Which cuts off the capital.

1 to 3, The architrave.

1 to 2, The frieze, and alſo the cornice.

WE ſhall here, as in the preceding Orders, obſerve that if the moveable leg be brought to 14, it gives the height of the column with it's entablature without a pedeſtal.

IN like manner the moveable leg brought to 4, cuts off the entablature without a column.

Of INTERCOLUMNIATIONS.

THUS having given the heights of the principal parts of this Order, we now proceed to the projections; to which we ſhall join the different diſtances, or intercolumniations ſuited to it.

The firft bar give us, befides the projections of the column and entablature, two different interco-lumniations, one of one module one half; the other of fifty-three minutes.

We fhall begin with the firft bar, fecond interval, tenth line, firft face.

Plate XI. Fig. A. The Sector opened from the beginning No. 1 (which anfwers to the axis of the column) to the laft divifion 8, we fhall have the greater half intercolumniation.

1 to 7, The cornice.
1 to 6, The leffer half intercolumniation.
1 to 5, The capital.

The remaining numbers are backward divifions; therefore

8 to 4, Is the plinth.
8 to 3, The greater half diameter.
8 to 2, The leffer half diameter.

Second interval, fecond bar, tenth line.

The column with pedeftals and two intercolumniations; one of one module, forty-eight minutes; the other of one module and twelve minutes.

Fig. B. The Sector opened from the beginning No. 1 to 9 the laft divifion, marks the greater half intercolumniation.

1 to 8, The leffer half intercolumniation.
1 to 7, The projection of the cornice.
1 to 6, The plinth, and cornice of the pedeftal.
1 to 5, The projection of the capital.

The remaining numbers are backward divifions, therefore

9 to 4, Gives the projection of the modilion band, the bafe of the column, and alfo the dye of the pedeftal.
9 to 3, The greater half diameter.
9 to 2, The leffer half diameter.

Of ARCHES.

Plate XII. We have now the heights and projections of this Order, with or without pedeftals, with their different intercolumniations; alfo the heights of columns and pedeftals feparately; we fhall next employ the inftrument in the formation of arches.

The heights of thefe are on the firft face, firft interval, and fourth or Corinthian line; this we have already done, as far as relates to the Order itfelf; upon the fame line however, there are feveral divifions marking the heights of arches, &c. which were omitted in forming colonnades, but become at prefent neceffary.

Open the Sector from the beginning of the fourth or Corinthian line, No. 1 to 5, marked k; this gives the bottom of the key-ftone to the leffer arch.

1 to 6 k, The bottom of the key-ftone to the greater arch.
1 to 8 i, The top of the impoft to the leffer arch.
1 to 10 i, The bottom of the impoft to the leffer arch, and top of that to the greater.
1 to 11 i, Fixes the bottom of the impoft to the greater arch.

These are all the general heights neceffary for drawing the arches of this Order; we fhall next proceed to their projections, which are found on the third and fourth bars of the fecond interval, firft face of the limb.

Projections

PROJECTIONS of Corinthian leſſer arch; third bar, ſecond interval, tenth line.

FIG. A. Open the Sector from the beginning No. 1 to the laſt diviſion 12, which cuts off one half of the arch.

1 to 11, The capital.
1 to 10, The leſſer half diameter.
1 to 9, The axis of the column.
1 to 8, The greater half diameter.
1 to 7, The outſide of the archivault.
1 to 6, The baſe.
1 to 5, The inſide of the archivault, and the pilaſter.
1 to 4, The impoſt.

THE remaining numbers are backward diviſions, therefore

12 to 3, The top of the key-ſtone.
12 to 2, The bottom of it.

PROJECTIONS of Corinthian greater arches, are on the fourth bar, ſecond interval, tenth line.

FIG. B. Open the Sector from No. 1 to 13, which cuts off one half of the arch.

1 to 12, The capital.
1 to 11, The leſſer half diameter.
1 to 10, The axis of the column.
1 to 9, The greater half diameter.
1 to 8, The outſide of the archivault.
1 to 7, The baſe of the column, and dye of the pedeſtal.
1 to 6, The plinth and cornice of the pedeſtal.
1 to 5, The inſide of the archivault, and alſo the pilaſter.
1 to 4, The impoſt.

THE remaining numbers are backward diviſions, therefore

13 to 2, AND 13 to 3, } Give the top and bottom of the key-ſtone.

Of a Single Pedeſtal, Column, or Entablature.

IF only a § ſingle pedeſtal, column, or entablature be wanted, we muſt firſt take the general heights of each, and then their general projections.

AND firſt for the heights of the pedeſtal. Fix the leg of the Sector at the beginning of the fifth bar, tenth line, ſecond interval, firſt face.

THE moveable leg carried to the laſt diviſion No. 4, gives the entire height of the pedeſtal; to 3 cuts off the height of the baſe; No. 2, being a backward diviſion, fix the moveable leg to the laſt diviſion on the bar, and bring the other to the backward diviſion, which will cut off the cornice, and alſo the dye.

PLATE XI. Fig. B. The general projections of the pedeſtal; firſt face, ſecond interval, ſecond bar, tenth line.

FIX one leg of the inſtrument at the beginning of the bar No. 1, and the other carried to No. 9, gives the greater half intercolumniation.

1 to 6, The projection of the baſe and cornice.

 THEN

§ See the example in the Tuſcan Order, Page 7, Plate XX, Fig. 1.

Then for the backward divifion,

9 to 4, Is the dye.

Columns without entablatures or pedeftals, are upon the firft face, third interval, fecond bar, the fifteenth line, is this Order.

The fixed leg placed at the beginning of the bar No. 1, and the moveable one carried to the laft divifion No. 4, gives the height of the column; brought back to 3 the bafe; and from 4 to 2 fixes the bottom of the trunk, and bottom of the capital, by a backward divifion.

Plate XI. Fig. B. The general projections of a fingle column; firft face, fecond interval, fecond bar.

The Sector fixed as before,

1 to 9, The greater half intercolumniation.
1 to 5, The capital.

The remaining are backward divifions; therefore

9 to 2, Is the top of the trunk.
9 to 3, The bottom of the trunk.
9 to 4, The bafe of the column.

The general heights of an entablature, are on the firft face, fecond interval, fixth bar, Corinthian line.

1 to 4, The entire height.
1 to 3, The architrave.
1 to 2, The frieze, and alfo the cornice.

The general projections of an entablature, are on the firft face, fecond interval, fecond bar, tenth line.

1 to 8, The cornice.
1 to 9, The greater half intercolumniation.

The remaining is a backward divifion,

9 to 2, The frieze, and alfo the bottom of the architrave.

Of the MEMBERS.

We fhall begin with the bafe of the pedeftal; the heights of which are on the fecond face of the limb, third interval, fecond bar, thirty-fixth line.

The PEDESTAL.

Plate XIII. One leg of the Sector placed at the beginning as ufual, and the other carried to the end of the bar; then

1 to 7, Cuts off the height of the bafe.
1 to 6, The inverted cavetto.
1 to 5, The fillet.
1 to 4, The cyma reverfa.
1 to 3, The fillet.
1 to 2, The tore and plinth.

The half heights of the dye of pedeftals; fecond face, third interval, fixth bar.

The Sector opened from the beginning No. 1 to the end 2 of the Corinthian line, gives half the height of the dye.

Cornice of pedeftals; third interval, third bar, thirty-fixth line.

The Sector opened from the beginning No. 1 to the laft divifion No. 7, gives the entire cornice of the pedeftal.

1 to 6,

1 to 6, The fillet.
1 to 5, The Doric cyma.
1 to 4, The corona.

THEN for the backward divifions,

7 to 3, The ovolo.
7 to 2, The fillet, and alfo the Doric cyma.

The COLUMN.

BASE of the column; fecond face, third interval, firft bar, thirty-fixth line.

ONE leg of the Sector placed at the beginning of the bar No. 1, and the other carried to the laft divifion No. 11, marks the entire height of the bafe.

1 to 10, The lower cincture.
1 to 9, The aftragal.
1 to 8, The upper tore.
1 to 7, The aftragal.
1 to 6, The upper fillet of the cavetto.
1 to 5, The cavetto.
1 to 4, The lower fillet to the cavetto.
1 to 3, The aftragal.
1 to 2, The lower tore, and alfo the plinth.

The CAPITAL.

FIG. B. For the heights of the capital, we muft take the fourth interval of the fecond face.

THE capital is laid down on the firft bar, forty-firft line.

ONE leg of the Sector fixed to the beginning of the bar No. 1, the other carried to the laft divifion 16, gives the entire height.

1 to 15, The ovolo of the abacus.
1 to 14, The fillet.
1 to 13, The cavetto.
1 to 12, The lip of the bafket, and the fecond revolution of the volute.
1 to 11, The eye of the volute.
1 to 10, The third revolution of the volute.
1 to 9, The bottom of the volute, and the top of the upper leaves.
1 to 8, The turning down of the upper leaves.
1 to 7, The top of the fecond row of leaves.
1 to 6, Their reverfe.
1 to 5, The firft row of leaves.
1 to 4, Their turning down.

THE remaining numbers are backward divifions; therefore

16 to 3, The bottom of the capital.
16 to 2, The aftragal, and lower cincture.

The ARCHITRAVE and FRIEZE.

THE next, or fecond bar of this fourth interval, and forty-firft line, gives the heights of the architrave and frieze.

OPEN the Sector as ufual, from the beginning No. 1 to the laft divifion 10, which marks the entire height of both thefe parts.

1 to 9, The frieze.
1 to 8, The fillet.
1 to 7, The Doric cyma.
1 to 6, The aftragal or bead.
1 to 5, The upper fafcia.
1 to 4, The aftragal or bead.

THE remaining numbers are backward divifions; therefore,

10 to 3, The middle fafcia.
10 to 4, The aftragal and lower fafcia.

HEIGHTS of cornices are to be found on the third bar of the fourth interval, forty-firft or Corinthian line.

THE Sector opened from the beginning 1 to the laft divifion 15, fhews the entire height.

1 to 14, The fillet.
1 to 13, The cyma.
1 to 12, The fillet.
1 to 11, The Doric cyma.
1 to 10, The corona.
1 to 9, The fillet.
1 to 8, The cyma, and top of the modilions.
1 to 7, The bottom of the modilions.
1 to 6, The top of the ovolo.
1 to 5, The bottom of it.
1 to 4, The dental fillet.

THE remaining numbers are backward divifions; therefore,

15 to 3, The dentals.
15 to 2, The cyma.

THESE are all the heights of this Order; we fhall now take, in the fame manner, the projections, which are all fet off from the axis of the column.

The PEDESTAL.

AND firft for the bafe of the pedeftal; fecond face, third interval, fourth bar, Corinthian line.

THE Sector opened from the beginning 1 to the laft divifion 6, gives the projection of the plinth and tore.

1 to 5, The fillet.
1 to 4, The cyma and fillet.
1 to 3, The cavetto.
1 to 2, The dye.

PROJECTIONS of cornice of pedeftals; fecond face, third interval, fifth bar, Corinthian line.

THE

The Sector opened from the beginning 1 to the laſt diviſion 10, gives the projection of the fillet.

1 to 9, The top of the Doric cyma.
1 to 8, The bottom of it.
1 to 7, The corona.
1 to 6, The ovolo.
1 to 5, The fillet.
1 to 4, The top of the Doric cyma.
1 to 3, The bottom of it.
1 to 2, The dye.

The COLUMN.

Base of the column; ſecond face, ſecond interval, firſt bar, Corinthian or thirty-firſt line.

The Sector opened from the beginning 1 to the laſt diviſion 6, gives the projection of the plinth and tore.

1 to 5, The lower aſtragal.
1 to 4, The lower fillet of the cavetto.
1 to 3, The upper fillet of the cavetto, and the center for the two aſtragals, and upper tore.
1 to 2, The greater half diameter of the column.

The CAPITAL.

Second face, ſecond interval, ſecond bar, Corinthian line.

The Sector opened from the beginning 1 to the laſt diviſion 19, contains the projection of the ovolo.

1 to 18, The fillet.
1 to 17, The ovolo.
1 to 16, The fillet, and cavetto, and outſide of the volute.
1 to 15, The cavetto.
1 to 14, The outſide of the firſt revolution of the volute.
1 to 13, The ſecond revolution of the volute.
1 to 12, The eye of the volute, and alſo the aſtragal.
1 to 11, The third revolution of the volute, and alſo the upper cincture.
1 to 10, The inſide of the volute, the leſſer half diameter, and the outſide of the lower leaf.
1 to 9, The middle of the outward leaf.
1 to 8, It's inſide.
1 to 7, The middle of the long leaf.
1 to 6, The outſide of the next lower leaf.
1 to 5, It's middle, and alſo of the ſtalk to the volute.

The remaining numbers are backward diviſions; therefore,

19 to 4, One ſide of the ſtalk.
19 to 3, The eye of the middle volute.
19 to 2, The inſide of the lower leaf.

The FRIEZE and ARCHITRAVE.

The frieze and architrave; ſecond face, ſecond interval, third bar, Corinthian line.

The Sector opened as uſual, from the beginning 1 to the laſt diviſion 7, gives the projection of the fillet.

1 to 6, The cyma.
1 to 5, The aſtragal.
1 to 4, The upper faſcia and aſtragal.
1 to 3, The middle faſcia, and aſtragal.
1 to 2, The lower faſcia, and frieze.

Of FRIEZE and CORNICE.

FRIEZE and cornice; ſecond face, ſecond interval, fourth bar, Corinthian line.

THE Sector opened from 1 to the laſt diviſion 23, gives the projection of the fillet of the cyma, or of the entire cornice.

1 to 22, The fillet.
1 to 21, The top of the Doric cyma.
1 to 20, The bottom of it.
1 to 19, The corona.
1 to 18, The fillet.
1 to 17, The cyma of the modilions, above.
1 to 16, The cyma of the modilions, below.
1 to 15, The outward modilion.
1 to 14, The ovolo.
1 to 13, The dental fillet.
1 to 12, The dental band.
1 to 11, The top of the Doric cyma.
1 to 10, The modilion.
1 to 9, The cyma.
1 to 8, The frieze.

THE remaining numbers are backward diviſions, therefore

23 to 7, The fillet to the cyma of the middle modilion;
23 to 6, AND 23 to 5, } The cyma.
23 to 4, Half a modilion
23 to 3, The denticle.
23 to 2, Half a dental.

WE have now laid down the heights and projections of all the parts of this Order.

Of IMPOSTS.

THE mouldings of the impoſts are laid down on the ſecond face, firſt interval; and the heights of thoſe adapted to the leſſer arches are marked on the firſt bar, twenty-ſixth or Corinthian line.

THE Sector opened from the beginning No. 1 to the laſt diviſion 12, gives the entire height of the impoſt.

1 to 11, The lower fillet.
1 to 10, The aſtragal.
1 to 9, The neck of the impoſt.
1 to 8, The ſecond fillet.
1 to 7, The ſecond aſtragal.
1 to 6, The large cyma.

1 to 5,

1 to 5, The fillet.
1 to 4, The ovolo.

THE remaining numbers are backward divifions, therefore

12 to 3, The corona.
12 to 2, The cyma and upper fillet.

THE heights of impofts for greater arches, are on the fecond face, firft interval, fecond bar, Corinthian line.

THE Sector opened from the beginning No. 1 to the laft divifion 12, gives the entire height.

1 to 11, The lower fillet.
1 to 10, The lower aftragal.
1 to 9, The neck of the impoft.
1 to 8, The fecond fillet.
1 to 7, The fecond aftragal.
1 to 6, The large cyma.
1 to 5, The fillet.
1 to 4, The ovolo.

THE remaining numbers are backward divifions, therefore

12 to 3, The corona.
12 to 2, The cyma, and upper fillet.

PROJECTIONS of thefe impofts are on the firft interval of the fecond face, third and fourth bars; and as archivaults always fall upon the impofts, we fhall at the fame time take off the different members belonging to them.

AND firft for the leffer impofts and archivaults; third bar, Corinthian line.

THE Sector opened from the beginning No. 1 to the laft divifion 16, gives the entire breadth of the archivault, and projection of the impoft.

1 to 15, AND 1 to 14, The cyma.
1 to 13, The corona.
1 to 12, The ovolo.
1 to 11, The third fillet, and alfo the cyma.
1 to 10, The firft and fecond fillet, and alfo the center of the aftragals.
1 to 9, The infide of the archivault, and neck of the impoft.
1 to 8, The firft fafcia.
1 to 7, The firft aftragal.
1 to 6, The fecond fafcia.
1 to 5, The fecond aftragal.
1 to 4, The fillet.

THE remaining numbers are backward divifions; therefore

16 to 3, The ovolo.
16 to 2, The cyma, and alfo the fillet.

WE next come to the greater impofts, and archivaults; fourth bar, Corinthian line.

THE Sector opened from the beginning 1 to the laft divifion 17, gives us the width of the archivault, and entire projection of the impoft.

1 to 16, AND 1 to 15, The cyma.

 1 to 14,

1 to 14, The corona.

1 to 13, The ovolo.

1 to 12, The fillet, and alſo the top of the cyma.

1 to 11, The lower fillet, and center of the lower aſtragal.

1 to 10, The ſecond fillet, and center of the aſtragal.

1 to 9, The inſide of the archivault, and neck of the impoſt.

1 to 8, The firſt faſcia.

1 to 7, The aſtragal.

1 to 6, The ſecond faſcia.

1 to 5, The middle aſtragal.

1 to 4, The fillet.

The remaining numbers are backward diviſions; therefore,

17 to 3, The ovolo.

17 to 4, The cyma and fillet.

Of ARCHIVAULTS.

The widths and heights of archivaults, and the projection of their members are on the fifth and ſixth bars, firſt interval, ſecond face.

First, Projections of archivaults for the leſſer arches; fifth bar, Corinthian line.

The Sector opened from the beginning 1 to the laſt diviſion 7, gives, as we ſaid before, the width of the archivault, and it's projection.

1 to 6, and 1 to 5, The cyma.

1 to 4, The ovolo.

1 to 3, The fillet, and middle faſcia.

1 to 2, The lower faſcia.

Projections of the archivaults of greater arches; ſixth bar, Corinthian line.

The Sector opened from the beginning 1 to the laſt diviſion 7, as before, gives the width and projection of the archivault.

1 to 6, and 1 to 5, The cyma.

1 to 4, The ovolo.

1 to 3, The fillet, and middle faſcia.

1 to 2, The lower faſcia.

Of BLOCK CORNICES.

Block cornices are on the ſecond face, ſecond interval, fifth and ſixth bars, Corinthian line.

First, for the heights; fifth bar.

Plate XVIII. The Sector opened from the beginning 1 to the laſt diviſion 13, gives the entire height.

1 to 12, The fillet.

1 to 11, The cyma.

1 to 10, The fillet.

1 to 9, The middle cyma.

1 to 8, The corona.

1 to 7, The fillet.

1 to 6,

1 to 6, The cyma to modilions.

1 to 5, The modilions.

1 to 4, The modilion band.

The remaining numbers are backward divisions; therefore

13 to 3, The cyma.

13 to 2, The astragal, and also the lower fillet.

Projections of block cornices; sixth bar.

The Sector opened from the beginning No. 1 to the last division 13, gives the entire projection beyond the upright of the wall.

1 to 12, The second fillet.

1 to 11, and 1 to 10, The cyma.

1 to 9, The corona.

1 to 8, The fillet.

1 to 7, and 1 to 6, The cyma to modilion.

1 to 5, The modilion.

Of the two backward divisions,

13 to 3, The modilion, and bottom of the cyma.

13 to 2, The lower fillet.

Of BALLUSTERS.

Ballusters are on the first face, fourth interval, fifth bar, Corinthian line.

Heights of ballusters; fourth interval, fifth bar, Corinthian line.

The Sector opened from the beginning 1 to the last division 9, gives half the height of the balluster.

1 to 8, The bottom, and consequently half of the middle astragal.

1 to 7, Gives only the line on which the greatest projection of the vase is to be marked; but this division is of no other use in the heights, and therefore marked with a cross.

1 to 7, Gives likewise only a line for the least projection of the concavity of the vase.

The remaining numbers are backward divisions; therefore,

9 to 5, The bottom of the vase.

9 to 4, The fillet.

9 to 3, The lower astragal.

9 to 2, The fillet, and top of the plinth.

Projections of ballusters; sixth bar.

The Sector opened from the beginning 1 to the last division 8, gives the projection of the entire balluster, or utmost projection of the vase; which put on paper we bisect, and this gives the semidiameter of the balluster, which could not be laid down upon the limb.

1 to 7, The plinth.

1 to 6, The fillet, and middle astragal.

1 to 5, The lower astragal.

1 to 4, The bottom of the vase.

1 to 3, The second fillet.

1 to 2, The least projection of the vase.

Of FLUTES.

The flutes and fillets of columns in plano, as well as thofe for upright columns and pilafters, are the fame for this Order as in the Ionic, which fee in that example.

Of DOORS.

After having the Order, as laid down on the firft face, firft interval, one leg of the Sector fixed at the beginning of the Corinthian line No. 1, let the other be opened to 12, marked d, upon the limb, then we fhall cut off the height of the door proportioned to colonnades without pedeftals; 1 to 9, marked alfo d, cuts off the heights of doors proportioned to colonnades with pedeftals.

These two divifions 12 and 9, were not mentioned when we were drawing the heights of this Order, being of no ufe, except for the above purpofe.

Heights of doors and their entablatures; firft face, third interval, firft bar, Corinthian line.

Having determined either the height, width, or half width of a door intended to be drawn; fix one leg of the Sector at the beginning of the bar, and open the other to any one of thofe given lengths, fuppofe the half width; then the meafure of that taken in the compaffes from the fcale the plan is drawn by, muft be applied to the Sector, and where it coincides upon two oppofite numbers, will become the proper fcale for the general heights of doors.

Plate XXI. The moveable leg of the Sector carried to the end of the line 12, gives the entire height of the door with it's entablature.

1 to 11, Cuts off the cornice.
1 to 9, The frieze.
1 to 8, The architrave, and confequently 1 to 8 is the height of the door, without the entablature.
1 to 3, The width of the door.
1 to 2, The half width, which we began with.

If we make ufe of a kneed architrave, then after taking

1 to 8, The height of the door,
1 to 11, Gives the top of the confole.
1 to 10, The eye of the upper volute.
1 to 9, The bottom of the upper volute.
1 to 7, The top of the lower volute.
1 to 6, The eye of the lower volute.
1 to 5, The bottom of the lower volute, and alfo the bottom of the knee.
1 to 4, Cuts off the length of the leaf.

N. B. In Fig. A we have drawn the architrave, and at Fig. B is a plan of it.

We now come to the particular mouldings for the entablature of doors; which are on the firft face, fourth interval.

Heights of entablatures of doors; firft bar, Corinthian line.

The Sector opened from the beginning 1 to the laft divifion 21, is the entire entablature.

1 to 20, Cuts off the fillet.
1 to 19, The cyma.
1 to 18, The fillet.
1 to 17, The cyma.
1 to 16, The corona.

1 to 15,

1 to 15, The ovolo.
1 to 14, The fillet.
1 to 13, The dentals.
1 to 12, The fillet.
1 to 11, The cyma.
1 to 10, The aſtragal, and alſo the frieze.
1 to 9, The frieze, and top of the architrave.
1 to 8, The fillet.
1 to 7, The ovolo.
1 to 6, The fillet.
1 to 5, The cyma.
1 to 4, The aſtragal.

The remaining numbers are backward diviſions, therefore

21 to 3, Gives the upper faſcia.
21 to 2, The cyma, and alſo the lower faſcia.

Projections of cornice of doors; ſecond bar.

The Sector opened from the beginning 1 to the laſt diviſion 12, is the greateſt projection of the cornice.

1 to 11, The fillet.
1 to 10, The top of the cyma.
1 to 9, The bottom of it.
1 to 8, The corona.
1 to 7, The ovolo.
1 to 6, The fillet.
1 to 5, The dentals.

The remaining numbers are backward diviſions, therefore

12 to 4, The fillet.
12 to 3, The top of the cyma.
12 to 2, The bottom of it, and alſo the aſtragal.

Projections of architraves of doors; third bar.

The Sector opened from the beginning No. 1 to the laſt diviſion 10, gives us both the height and projection of the architrave.

1 to 9, The ovolo.
1 to 8, The fillet.
1 to 7, The top of the cyma.
1 to 6, The bottom of it, and alſo the aſtragal.
1 to 5, The firſt faſcia.
1 to 4, and 1 to 3, The cyma.
1 to 2, The lower faſcia, and frieze.

Of CONSOLES.

The half heights of conſoles, are on the firſt face, ſecond interval, ſeventh bar, Corinthian line.

Plate XXIII. The Sector opened from the beginning 1 to the laſt diviſion 7, gives half the height of the entire conſole.

1 to 6,

1 to 6, The eye of the upper volute.
1 to 5, The bottom of it.
1 to 4, The top of the lower volute.
1 to 3, The eye of it.
1 to 2, The bottom of the volute, and top of the leaf.

Widths of conſoles; firſt face, fourth interval, fourth bar, twentieth line.

The Sector opened from the beginning 1 to the laſt diviſion 13, gives us the height of the architrave, and breadth of the conſole.

1 to 12, The fillet.
1 to 11, The cavetto.
1 to 10, The fillet.
1 to 9, The cyma.
1 to 8, The fillet.
1 to 7, The aſtragal.
1 to 6, The fillet.
1 to 5, The cyma.
1 to 4, The fillet.
1 to 3, The cavetto.
1 to 2, The fillet.

The

The USE of the

ARCHITECTONIC SECTOR,

In drawing the Compoſite or Roman Order.

GENERAL HEIGHTS.

CHAP. VI.

THE uſe of the inſtrument in drawing the general heights of the Compoſite or Roman Order, as laid down on the firſt face of the limb, firſt interval, and fifth line.

PLATE XIV. Screw one leg of the Sector to the beginning of the fifth line No. 1, then move the other till it cuts the laſt diviſion 18; this is the total height of the Order.

BRING back the moveable leg to 17, this cuts off the baſe of the pedeſtal.

1 to 16, The dye.
1 to 15, The cornice of the pedeſtal.
1 to 14, The baſe of the column.

THEN paſſing over the diviſions marked with letters, that belong to doors or arches, bring the moveable leg from

1 to 7, The trunk.

HERE likewiſe paſs by No. 6 and 5, both marked with letters, and bring the moveable leg from

1 to 4, Which cuts off the capital.
1 to 3, The architrave.
1 to 2, The frieze, and alſo the cornice.

HERE as before, we ſhall obſerve, that if the moveable leg be brought to 14, it gives the height of the column with it's entablature without a pedeſtal.

IN like manner the moveable leg brought to 4, cuts off the entablature without a column.

Of INTERCOLUMNIATIONS.

THUS having given the heights of the principal parts of this Order, we now proceed to the projections; to which we ſhall join the different diſtances, or intercolumniations ſuited to it: we have projections proper to each, viz. on the firſt and ſecond bars, ſecond interval, firſt face.

The firſt bar gives us, beſides the projections of the column and entablature, two different intercolumniations, one of one module and one half; the other of one module.

We ſhall begin with the firſt bar, eleventh line.

The Sector opened from the beginning No. 1 (which anſwers to the axis of the column) to the laſt diviſion 8, we ſhall have the greater half intercolumniation.

1 to 7, The projection of the cornice.
1 to 6, The leſſer half intercolumniation.
1 to 5, The projection of the capital.

The remaining numbers are backward diviſions; therefore,

8 to 4, The plinth.
8 to 3, The greater half diameter.
8 to 2, The leſſer half diameter.

Second bar, ſecond interval, eleventh line.

The Roman columns with pedeſtals, and two intercolumniations; one of two modules; the other of one module and ten minutes.

The Sector opened from the beginning of the bar No. 1 to the laſt diviſion 9, marks the greater half intercolumniation.

1 to 8, The projection of the cornice.
1 to 7, The leſſer half intercolumniation.
1 to 6, The baſe and cornice of the pedeſtal.
1 to 5, The projection of the capital.

The remaining numbers are backward diviſions; therefore,

9 to 4, Gives the projection of the baſe of the column, and dye of the pedeſtal.
9 to 3, The greater half diameter.
9 to 2, The leſſer half diameter.

Of A R C H E S.

We have now the heights and projections of this Order, with or without pedeſtals, with their different intercolumniations; alſo the heights of columns and pedeſtals ſeparately; we ſhall next employ the inſtrument in the formation of arches.

The heights of theſe are on the firſt interval, and fifth or Roman line; this we have already done, as far as relates to the Order itſelf; upon the ſame line however, there are ſeveral diviſions marking the heights of arches, &c. which were omitted in forming colonnades, but become at preſent neceſſary.

Plate XV. Open the Sector from the beginning of the fifth or Roman line No. 1 to 5 marked k; this gives the bottom of the key-ſtone to the leſſer arch.

1 to 6 k, The bottom of the key-ſtone to the greater arch.
1 to 8 i, The top of the impoſt to the leſſer arch.
1 to 10 i, The bottom of the impoſt to the leſſer arch.
1 to 11 i, The top of that to the greater arch.
1 to 12 i, Fixes the bottom of the impoſt to the greater arch.

These are all the general heights neceſſary for drawing the arches of this Order; we ſhall next proceed to their projections, which are found on the third and fourth bars of the ſecond interval, firſt face of the limb.

Projections

PROJECTIONS of leſſer arches, are on the third bar, ſecond interval, eleventh line.

FIX the Sector as before, to No. 1, and open it to No. 12, which cuts off half the width of the whole arch, and the projection of the cornice.

1 to 11, The capital.
1 to 10, The leſſer half diameter.
1 to 9, The axis of the column.
1 to 8, The greater half diameter.
1 to 7, The outſide of the archivault.
1 to 6, The baſe of the column.
1 to 5, The pilaſter, and inſide of the archivault.
1 to 4, The impoſt.

THEN for the backward diviſions,

12 to 3, AND 12 to 2, } Give the top and bottom of the key-ſtone.

PROJECTIONS of greater arches, are on the fourth bar, ſecond interval, eleventh line.

FIX the inſtrument as before, and move it to No. 13, which gives half the whole arch, and projection of the cornice.

1 to 12, The capital.
1 to 11, The leſſer half diameter.
1 to 10, The axis of the column.
1 to 9, The greater half diameter.
1 to 8, The outſide of the archivault.
1 to 7, The baſe of the column, and dye of the pedeſtal.
1 to 6, The plinth, and alſo the cornice of the pedeſtal.
1 to 5, The pilaſter, and alſo the inſide of the archivault.
1 to 4, The impoſt.

THE remaining are backward diviſions; therefore

13 to 3, AND 13 to 2, } Cuts off the top and bottom of the key-ſtone.

Of a Single Pedeſtal, Column, or Entablature.

IF only a § ſingle pedeſtal, column, or entablature be wanted, we muſt firſt take the general heights of each, and then their general projections.

FIX the leg of the Sector at the beginning of the fifth bar, ſecond interval, eleventh line, firſt face.

THE moveable leg carried to the laſt diviſion No. 4, gives the entire height of the pedeſtal; to 3 cuts off the height of the baſe; No. 2, being a backward diviſion, fix the moveable leg to the laſt diviſion on the bar, and bring the other to the backward diviſion, this will cut off the cornice, and alſo the dye.

PLATE XIV. Fig. B. The general projections of the pedeſtal; firſt face, ſecond interval, ſecond bar, fifth line, where we have the projections of great colonnades.

FIX one leg of the inſtrument at the beginning of the bar No. 1, and the other carried to No. 9, will give the greater half intercolumniation.

1 to 6, The projection of the baſe, and alſo the cornice.

THE remaining number is a backward diviſion; therefore,

9 to 4, Is the dye.

§ See this example fully explained in the Tuſcan Order, Page 7, Plate XX, Fig. 1.

C[illegible] tures or pedestals, are placed upon the third interval, second bar, sixteenth line in the Composite Order.

The fixed leg [illegible] at the beginning of the bar No. 1, and the moveable one carried to the last division No. 4 gives the height of the column; brought back to 3 the base; and the backward division from 4 to 2 fixes the bottom of the trunk, and bottom of the capital.

The general projections of a single column; first face, second interval, second bar, eleventh line.

1 to 9, Is the greater half intercolumniation.
1 to 5, The capital.

The remaining numbers are backward divisions; therefore

9 to 2, Is the top of the trunk.
9 to 3, The bottom of the trunk.
9 to 4, The base of the column.

The general heights of an entablature, are on the first face, second interval, sixth bar, Composite line.

1 to 4, The entire height.
1 to 3, The architrave.
1 to 2, The frieze.

The general projections of an entablature; first face, second interval, second bar, Composite line.

1 to 9, The greater half intercolumniation.
1 to 8, The cornice.

The remaining number is a backward division; therefore,

9 to 2, Cuts off the frieze and architrave.

Thus far the instrument has assisted us in fixing the general measures of this Order; there remains to shew the method of setting off the heights and projections of every individual member.

Of the MEMBERS.

We shall begin with the base of the Roman pedestal; the heights of which are laid down on the second face of the limb, third interval, second bar, thirty-seventh line.

The PEDESTAL.

Plate XVI. One leg of the Sector placed at the beginning as usual, and the other carried to the end of the bar; then,

1 to 7, Cuts off the height of the base.
1 to 6, The upper fillet.
1 to 5, The astragal.
1 to 4, The cyma reversa.
1 to 3, The lower fillet.
1 to 2, The tore, and also the plinth.

The half heights of the dye of pedestals; second face, third interval, sixth bar.

The Sector opened from the beginning 1 to the end 2 of the Roman line, gives half the height of the dye.

Cornice of pedestals; third interval, third bar, thirty-seventh line.

The Sector opened from the beginning No. 1 to the last division No. 8, gives the entire cornice of the pedestal.

1 to 7, The fillet.

1 to 6,

1 to 6, The cyma.

1 to 5, The corona.

1 to 4, The fillet.

The remaining numbers are backward divifions; therefore

8 to 3, The cyma.

8 to 2, The aftragal, and alfo the lower fillet.

The COLUMN.

Base of the column; fecond face, third interval, firft bar, thirty-feventh line.

One leg of the Sector placed at the beginning of the bar No. 1, and the other carried to the laft divifion 15, marks the entire height of the bafe.

1 to 14, The height of the lower cincture.

1 to 13, The upper aftragal.

1 to 12, The upper tore.

1 to 11, The hollow moulding.

1 to 10, The upper fillet of the cavetto.

1 to 9, The cavetto.

1 to 8, The lower fillet of the cavetto.

1 to 7, The upper aftragal.

1 to 6, The lower aftragal.

1 to 5, The upper fillet of the lower cavetto.

1 to 4, The lower cavetto.

1 to 3, The fillet of the lower cavetto.

1 to 2, The lower tore, and alfo the plinth.

The CAPITAL.

For the heights of the capital and entablature, we muft take the fourth interval of the fecond face.

The capital is laid down on the firft bar, forty-fecond line.

One leg of the Sector fixed to the beginning of the bar No. 1, the other carried to the laft divifion 15, gives the entire height.

1 to 14, The ovolo of the abacus.

1 to 13, The fillet, and top of the volute.

1 to 12, The cavetto, and top of the fecond revolution of the volute.

1 to 11, The ovolo, and top of the eye of the volute.

1 to 10, The aftragal, and bottom of the eye of the volute.

1 to 9, The cincture, and bottom of the the third revolution of the volute.

1 to 8, The bottom of the fecond revolution of the volute..

1 to 7, The bottom of the volute, and top of the upper row of leaves.

1 to 6, The turning down of the leaves.

1 to 5, The top of the lower leaves.

1 to 4, Their turning down.

The remaining numbers are backward divifions; therefore,

15 to 3, The bottom of the capital.

15 to 2, The aftragal, and alfo the lower cincture.

The ARCHITRAVE and FRIEZE.

The next, or ſecond bar of this fourth interval, and forty-ſecond line, gives the heights of the Roman architrave and frieze.

Open the Sector as uſual, from the beginning No. 1 to the laſt diviſion 9, this marks the entire height of both theſe parts.

1 to 8, The frieze.
1 to 7, The fillet.
1 to 6, The cavetto.
1 to 5, The Doric cyma.
1 to 4, The aſtragal.
1 to 3, The upper faſcia.
1 to 2, The Doric cyma, and lower faſcia.

Heights of cornices are to be found on the third bar of the fourth interval, forty-ſecond or Roman line.

The Sector opened from the beginning 1 to the laſt diviſion 15, ſhews the entire height.

1 to 14, The fillet.
1 to 13, The cyma.
1 to 12, The fillet.
1 to 11, The Doric cyma.
1 to 10, The corona.
1 to 9, The ovolo to modilions.
1 to 8, The aſtragal to modilions.
1 to 7, The upper modilion band.
1 to 6, The cyma to modilions.

The remaining numbers are backward diviſions; therefore,

15 to 5, Gives the bottom of the modilion.
15 to 4, The modilion band.
15 to 3, The Doric cyma.
15 to 2, The aſtragal, and alſo the fillet.

These are all the heights of this Order; we ſhall now take in the ſame manner, the projections, which are all ſet off from the axis of the column.

The PEDESTAL.

And firſt for the baſe of the pedeſtal; ſecond face, third interval, fourth bar, Roman line.

The Sector opened from the beginning No. 1 to the laſt diviſion 6, gives the projection of the plinth and tore.

1 to 5, The fillet.
1 to 4, The aſtragal.
1 to 3, The fillet.
1 to 2, The dye.

Projections of cornice of pedeſtals; ſecond face, third interval, fifth bar, Roman line.

The Sector opened from the beginning 1 to the laſt diviſion 9, gives the projection of the fillet.

1 to 8, and 1 to 7, } The cyma.

1 to 6,

1 to 6, The corona.
1 to 5, The fillet, and top of the cyma.
1 to 4, The aſtragal.
1 to 3, The fillet, and bottom of the cyma.
1 to 2, The dye.

The COLUMN.

Base of the column; ſecond face, ſecond interval, firſt bar, Roman or thirty-ſecond line.

The Sector opened from the beginning No. 1 to the laſt diviſion 7, gives the projection of the plinth and tore.

1 to 6, The lower fillet of the cavetto.
1 to 5, The upper fillet of the cavetto, and the center for the two aſtragals, and projection of the upper tore.
1 to 4, The fillet to the upper cavetto, and lower cincture.
1 to 3, The hollow moulding.
1 to 2, The greater half diameter of the column.

The CAPITAL.

Second face, ſecond interval, ſecond bar, Roman line.

The Sector opened from the beginning No. 1 to the laſt diviſion 19, contains the projection of the ovolo.

1 to 18, The fillet.
1 to 17, The ovolo, the outer cavetto, and the outſide of the volute.
1 to 16, The fillet.
1 to 15, The inner cavetto.
1 to 14, The firſt revolution of the volute.
1 to 13, The reverſe of the outer lower leaf.
1 to 12, The aſtragal, and ſecond revolution of the volute.
1 to 11, The third revolution of the volute, and alſo the cincture.
1 to 10, The eye of the volute, the outſide of the lower leaf, and alſo the leſſer half diameter of the column.
1 to 9, The inſide of the third revolution, and the middle of the outer leaf.
1 to 8, The inſide of the ſecond revolution of the volute.
1 to 7, The width of the lower outward leaf.
1 to 6, The inſide of the firſt revolution, and the middle of the long leaf.
1 to 5, The outſide of the next lower leaf.
1 to 4, The middle of the leaf, and alſo the ſtalk to the ornament between the leafs.

The remaining numbers are backward diviſions; therefore,

19 to 3, One ſide of the ornament between the leafs.
19 to 2, The inſide of the lower leaf.

The FRIEZE and ARCHITRAVE.

The frieze and architrave; ſecond face, ſecond interval, third bar, Roman line.

The Sector opened as uſual, from the beginning No. 1 to the laſt diviſion 9, gives the projection of the fillet.

 1 to 8,

1 to 8, The cavetto.
1 to 7, The cyma.
1 to 6, The bottom of the cyma, and the aſtragal.
1 to 5, The ſecond faſcia.
1 to 4, AND 1 to 3, The cyma.
1 to 2, The firſt faſcia, and frieze.

Of FRIEZE and CORNICE.

Frieze and cornice; ſecond face, ſecond interval, fourth bar, Roman line.

The Sector opened from the beginning 1 to the laſt diviſion 22, gives the fillet of the cyma, or entire projection of the cornice.

1 to 21, The cyma and fillet.
1 to 20, The top of the Doric cyma.
1 to 19, The bottom of it.
1 to 18, The corona.
1 to 17, The ovolo.
1 to 16, The aſtragal.
1 to 15, The outward modilion.
1 to 14, AND 1 to 13, The cyma.
1 to 12, The bottom of the modilion.
1 to 11, The modilion band.
1 to 10, The cyma.
1 to 9, The aſtragal.
1 to 8, The fillet.
1 to 7, The frieze.

The remaining numbers are backward diviſions, therefore

22 to 6, The ovolo to the middle modilion.
22 to 5, The upper half of the modilion.
22 to 4, AND 22 to 3, The cyma.
22 to 2, The lower half of the modilion.

Of IMPOSTS.

The heights of impoſts are laid down on the ſecond face, firſt interval; and the height of thoſe adapted to the leſſer arches, are marked on the firſt bar, twenty-ſeventh or Compoſite line.

The Sector opened from the beginning 1 to the laſt diviſion 13, gives the entire height of the impoſt.

1 to 12, The fillet.
1 to 11, The aſtragal.
1 to 10, The neck of the impoſt.
1 to 9, The fillet.
1 to 8, The aſtragal.
1 to 7, The ovolo.

1 to 6,

1 to 6, The fillet.
1 to 5, The cyma.
1 to 4, The fillet.

The remaining numbers are backward divifions; therefore,

13 to 3, The corona.
13 to 2, The cyma, and alfo the upper fillet.

Heights of impofts for greater arches, are on the fecond bar, firft interval, Roman or twenty-feventh line.

The Sector opened from the beginning 1 to the laft divifion 13, fhews the entire height.

1 to 12, The lower fillet.
1 to 11, The aftragal.
1 to 10, The neck.
1 to 9, The fillet.
1 to 8, The aftragal.
1 to 7, The ovolo.
1 to 6, The fillet.
1 to 5, The cyma.
1 to 4, The fillet.

The remaining numbers are backward divifions; therefore,

13 to 3, The corona.
13 to 2, The cyma, and alfo the upper fillet.

Projections of thefe impofts are on the firft interval of the fecond face, third and fourth bars; and as archivaults always fall upon the impofts, we fhall at the fame time take off the different members belonging to them.

And firft for the leffer impofts and archivaults; third bar, Roman line.

The Sector opened from the beginning 1 to the laft divifion 17, gives the entire breadth of the archivault, and projection of the impoft.

1 to 16, and 1 to 15, The cyma.
1 to 14, The corona.
1 to 13, The fillet and cyma.
1 to 12, The fillet, and bottom of the cyma.
1 to 11, The ovolo.
1 to 10, The upper aftragal, the center of the lower one, and the lower fillet.
1 to 9, The fillet to the upper aftragal.
1 to 8, The infide of the archivault, the neck, and pilafter.
1 to 7, The firft fafcia.
1 to 6, The aftragal.
1 to 5, The middle fafcia.
1 to 4, The aftragal.

The remaining numbers are backward divifions; therefore,

17 to 3, The upper fafcia.
17 to 2, The cyma, and alfo the fillet.

 We

We come next to the greater impoſts, and archivaults; fourth bar, Roman line.

The Sector opened from the beginning 1 to the laſt diviſion 17, gives the width of the archivault, and entire projection of the impoſt.

1 to 16, AND 1 to 15, } The cyma.
1 to 14, The corona.
1 to 13, The fillet, and cyma.
1 to 12, The fillet, and bottom of the cyma.
1 to 11, The ovolo.
1 to 10, The upper aſtragal, the center of the lower aſtragal, and it's fillet.
1 to 9, The fillet, and center of the upper aſtragal.
1 to 8, The inſide of the archivault, the neck and pilaſter.
1 to 7, The lower faſcia.
1 to 6, The aſtragal.
1 to 5, The middle faſcia.
1 to 4, The aſtragal.

Of the two backward diviſions,

17 to 3, The upper faſcia.
17 to 2, The cyma, and alſo the upper fillet.

Thus we have the widths and heights of archivaults; the projections of their members are ſeldom drawn in plans, but yet abſolutely neceſſary to be known, they are therefore on the fifth and ſixth bars, firſt interval, ſecond face.

Of ARCHIVAULTS.

First, Projections of archivaults for the leſſer arches; fifth bar, Roman or twenty-ſeventh line.

The Sector opened from the beginning No. 1 to the laſt diviſion 7, gives, as we ſaid before, the width of the archivault, and it's projection.

1 to 6, AND 1 to 5, } The cyma.
1 to 4, The upper faſcia, and aſtragal.
1 to 3, The middle faſcia, and aſtragal.
1 to 2, The lower faſcia.

Projections of archivaults of greater arches; ſixth bar, Roman line.

The Sector opened from the beginning 1 to the laſt diviſion 7, as before, gives the width and projection of the archivault.

1 to 6, AND 1 to 5, } The cyma.
1 to 4, The upper faſcia, and aſtragal.
1 to 3, The middle faſcia, and aſtragal.
1 to 2, The lower faſcia.

Of BLOCK CORNICES.

The next thing we ſhall take from the inſtrument is the method of delineating block cornices, which are on the ſecond face, ſecond interval, fifth and ſixth bars, Roman line.

First,

First, for the heights; fifth bar.

The Sector opened from the beginning No. 1, to the last division 13, gives the entire height.

1 to 12, The fillet.
1 to 11, The cyma.
1 to 10, The fillet.
1 to 9, The cyma.
1 to 8, The corona.
1 to 7, The ovolo.
1 to 6, The astragal.
1 to 5, The modilion.
1 to 4, The bottom of the modilion.

The remaining numbers are backward divisions; therefore

13 to 3, The modilion band.
13 to 2, The ovolo, and also the fillet.

Projections of block cornices; sixth bar.

The Sector opened from the beginning No. 1 to the last division No. 18, gives the entire projection beyond the upright of the wall.

1 to 17, The fillet, and bottom of the cyma.
1 to 16, and 1 to 15, The cyma.
1 to 14, The corona.
1 to 13, The ovolo.
1 to 12, The astragal.
1 to 11, The upper fascia of the outward modilion.
1 to 10, The lower fascia of it.
1 to 9, The ovolo to modilion.
1 to 8, It's astragal.
1 to 7, The upper fascia of the modilion.

The remaining numbers are backward divisions; therefore,

18 to 6, The bottom of the modilion.
18 to 5, The ovolo.
18 to 4, The lower fascia of the modilion.
15 to 3, The upper fascia of it.
15 to 2, The lower fillet, and bottom of the ovolo.

Of BALLUSTERS.

Plate XIX. We come next to ballusters, which are on the first face, fourth interval, fifth and sixth bars.

Heights of ballusters; fourth interval, fifth bar, Roman line.

The Sector opened from the beginning 1 to the last division 11, gives half the entire height.

1 to 10, Half the middle fillet.
1 to 9, The fillet and cavetto.
1 to 8, The bottom of the cavetto.
1 to 7, The fillet, and top of the vase.

1 to 6,

1 to 6, Gives only the line on which the greateft projection of the vafe is to be marked; but this divifion is of no other ufe in the heights, and therefore marked with a crofs.

1 to 5, Gives the leaft projection of the concavity of the vafe, or the narroweft part of it.

The remaining numbers are backward divifions; therefore

11 to 4, The bottom of the vafe.

11 to 3, The fillet.

11 to 2, The ovolo reverfed, and the plinth.

Projections of ballufters; fixth bar.

The Sector opened from the beginning No. 1 to the laft divifion 6, gives the projection of the entire ballufter, which put on paper we bifect, and this gives the femi-diameter of the ballufter, which could not be laid down on the limb.

1 to 5, The ovolo reverfed.

1 to 4, The lower and upper little fillet.

1 to 3, The middle fillet of the cavetto.

1 to 2, The concavity of the neck.

We have now given an example of every thing that can be drawn by the inftrument, except flutes with their fillets, and doors with their ornaments.

Of FLUTES.

The flutes and fillets of colomns in plano, as well as thofe for upright columns and pilafters, are the fame for this Order as in the Ionic, which fee in that example.

Of DOORS.

Doors are fometimes placed in colonnades, as in porticos of temples, and then their heights muft be proportioned to the columns.

After having drawn the Order, as laid down on the firft face, firft interval; one leg of the Sector fixed at the beginning of the Roman line No. 1, let the other be opened to 13, marked d, upon the limb, then we fhall cut off the height of the door proportioned to colonnades without pedeftals; 1 to 9, marked alfo d, cuts off the heights of doors proportioned to colonnades with pedeftals.

These two divifions 13 and 9, were not mentioned when we were drawing the heights of this Order, being of no ufe, except for the above purpofe.

If doors are to be placed in arches, their height is fixed, becaufe the top of the entablature fhould always run in a line with the top of the impoft, and the impoft moulding ought by rights to form thofe of the cornice, as we have fhewn in plate XXI.

Heights of doors and their entablatures; firft face, third interval, firft bar, Roman line.

Having determined either the height, width, or half width of a door intended to be drawn; fix one leg of the Sector at the beginning of the bar, and open the other to any of thofe given lengths, fuppofe the half width; then the meafure of that taken in the compaffes from the fcale the plan is drawn by, muft be applied to the Sector, where it coincides upon two oppofite numbers, will become the proper fcale for the general heights of doors.

The

The moveable leg of the Sector carried to the end of the line 12, gives the entire height of the door with it's entablature.

1 to 11, Cuts off the cornice.
1 to 9, The frieze.
1 to 8, The architrave, and consequently the height of the door without the entablature.
1 to 3, The width of the door.
1 to 2, The half width which we began with.

If we make use of a kneed architrave, after taking

1 to 8, The height of the door, then
1 to 5, Gives the depth of the knee.

If a console is to be added, it is generally to support the cornice, and to terminate with the bottom of the knee, with a leaf from it.

1 to 11, Gives the top of the console.
1 to 10, The eye of the upper volute.
1 to 7, The top of the lower volute.
1 to 6, The eye of the lower volute.
1 to 5, The bottom of the lower volute.
1 to 4, Cuts off the height of the leaf.

Having thus got the general heights of door entablatures, we now come to the particular mouldings, which are on the first face, fourth interval.

Plate XXII. Heights of entablature of doors; first bar, Roman line.

The Sector opened from the beginning 1 to the last division 21, is the entire entablature.

1 to 20, The fillet.
1 to 19, The cyma.
1 to 18, The fillet.
1 to 17, The cyma.
1 to 16, The corona.
1 to 15, The ovolo.
1 to 14, The fillet.
1 to 13, The cyma.
1 to 12, The fillet.
1 to 11, The cavetto.
1 to 10, The astragal.
1 to 9, The frieze, and top of the architrave.
1 to 8, The fillet.
1 to 7, The cyma.
1 to 6, The astragal.
1 to 5, The upper fascia.
1 to 4, The astragal.

Then for the backward divisions,

21 to 3, Gives the middle fascia.
21 to 2, The astragal, and lower fascia.

PROJECTIONS of cornice of doors; ſecond bar.

THE Sector opened from the beginning 1 to the laſt diviſion 12, gives the greateſt projection.

1 to 11, The fillet and bottom of the cyma.

1 to 10, AND 1 to 9, The cyma.

1 to 8, The corona.

1 to 7, The ovolo.

1 to 6, The fillet.

1 to 5, The top of the cyma.

THE remainder are backward diviſions.

12 to 4, The bottom of the cyma.

12 to 3, The fillet and cavetto.

13 to 2, The cavetto, and the aſtragal.

PROJECTIONS of architraves of doors; third bar.

AS the entire projection of architraves are too ſmall to be laid down by themſelves on the ſcales, we are obliged here, as in archivaults, to add ſome certain meaſure before them; for which purpoſe we chooſe to repeat the height of the architrave itſelf.

THE Sector opened, from the beginning No. 1 to the laſt diviſion 7, gives us both the height and projection of the architrave.

1 to 6, AND 1 to 5, The cyma, and alſo the aſtragal.

1 to 4, The upper faſcia and aſtragal.

1 to 3, The middle faſcia and aſtragal.

1 to 2, The lower faſcia and frieze.

Of CONSOLES.

THE half heights of conſoles, are on the firſt face, ſecond interval, ſeventh bar, Roman line.

PLATE XXIII. The Sector opened from No. 1 to the laſt diviſion 7, gives half the height of the entire conſole.

1 to 6, The eye of the upper volute.

1 to 5, The bottom of it.

1 to 4, The top of the lower volute.

1 to 3, The eye of it.

1 to 2, The bottom of the volute, and the top of the leaf.

WIDTHS of conſoles; firſt face, fourth interval, fourth bar, twenty-firſt line.

THE Sector opened from the beginning No. 1 to the laſt diviſion 15, gives us, as we ſaid before, the height of the architrave, and breadth of the conſole.

1 to 14, The fillet.

1 to 13, The cavetto.

1 to 12, The fillet.

1 to 11, The cyma.

1 to 10,

1 to 10, The fillet.
1 to 9, The aſtragal.
1 to 8, The fillet.
1 to 7, The aſtragal.
1 to 6, The fillet.
1 to 5, The cyma.
1 to 4, The fillet.
1 to 3, The cavetto.
1 to 2, The fillet.

CHAP. VII.

A farther Defcription, and other Ufes of the Architectonic Sector; by various Examples.

THERE are many other ufes to which the inftrument may be applied, befides thofe already explained, which we will now confider, but with as much brevity as poffible.

IN the beginning of the defcription and ufe of this inftrument, page 2, we mentioned the two principal lines, or fcales, which are on both fides of the limb; and obferved, that the line of 60 is an univerfal fcale of modules, for drawing the different Orders of architecture to the greateft degree of accuracy.

Now fince the line of 60 is conftructed upon the very fame principles as the line of lines on the common Sector; therefore it univerfally will be obvious at firft fight, to any one who is acquainted with that inftrument; and the great ufe already made of it, in drawing the preceding examples, muft, we apprehend, have made it very familiar to every attentive reader.

ABOVE the fcale of 60 is another line, numbered with Roman capital figures, viz. I, II, &c. to XV, thefe numbers are adapted to the divifions of the former fcale, and ftand over every fourth divifion of the primary ones.

HENCE if we call each of the primary divifions on the fcale of 60, that ftand oppofite to the Roman figures, inches; then every primary, will ftand for a quarter of an inch; and each of the fmaller or fecondary divifions with fhort ftrokes, will anfwer to the twelfth part of an inch.

IN like manner, if we call the fpace between two of the Roman figures, one foot; then the intermediate primary divifions, being one quarter of a foot, will reprefent three inches; and the fhort ftrokes, within the fame fpace on the fcale of 60, ftand for inches; and thefe laft are alfo fub-divided into half inches by dotted divifions.

BY this method of numbering, we have two univerfal fcales of feet and inches: by the firft, we are enabled to take off what meafures we pleafe, from any fcale reprefenting lefs than 15 inches to the twenty-fourth part of an inch; by the fecond, any meafure lefs than 15 feet, to the 1-8th of an inch.

BUT we muft always carefully obferve, to take all the meafures on both the fcales, from the dotted lines on the fcale of 60.

THUS much may fuffice, for a farther defcription of the inftrument; we will now proceed to fhew it's ufefulnefs by many neceffary examples.

EXAMPLE I.

PLAT. XXIV. Fig. 1. To divide a line into any number of equal parts; fuppofe 9 parts.

TAKE the length of the line A B in your compaffes, and make this diftance correfpond with the divifion

divifion on the line of 60; that is, directly under the Roman figures IX, IX; keep the Sector fixed; and from the fame line of 60, take the fpace between 1 and 1, which will be the 1-9th of the whole line, and confequently will divide it into the number of equal parts propofed.

But the fame thing may be done by the line of 60 only, viz. fet the length of the line from 9 to 9, then from 1 to 1 is the 1-9th required; or, if the line be too long to be taken fo near the center of the inftrument, then doubling the number will anfwer the fame end: thus from 18 to 18, and from 2 to 2 will have the fame proportion to each other, as from 9 to 9, and from 1 to 1.

In like manner, a line may be divided into any number of equal parts, greater than what are expreffed on the inftrument; fuppofe for inftance, 120 parts; take the length of the line, and fet from 60 to 60, and the one half of the firft divifion between 1 and the center of the Sector is the part required.

Fig. 2. To divide the line A B into two equal parts, take half of it, viz. A C, and fit it to 60, 60, then 1 to 1 is the fpace fought for. Again, if a line be too long for the compafs of the inftrument, then divide it into 1-half, 1-3d, 1-4th, &c. and proceed as directed in the laft paragraph.

It will be obvious, that when the divifions (of what nature foever) are to be under 15, or when by bifecting a line, &c. any other number can be obtained, that the fcale of Roman figures is to be preferred, becaufe the parts being larger and fewer, will therefore be extremely ufeful on many occafions.

EXAMPLE II.

Fig. 3. To encreafe or diminifh a line in any proportion.

Let it be required to encreafe the line A C, from 30 to 50 feet; that is, two thirds.

Take the length of the line A C in the compaffes, and make the Sector correfpond with it at 30, 30; then take the diftance from 20 to 20, and transfer it from C to B, and then B C being two thirds of A C, and added to A C, will increafe the line A C as was required, viz. from 30 to 50 feet.

EXAMPLE III.

Fig. 3. To diminifh a line, viz. from 50 to take away 20 feet.

Fit the given length A B to 50, 50; take the diftance 20 to 20, and fet from B towards A, and then will A C be diminifhed 20 parts out of 50, that is, made fhorter by two thirds. If the lines are to be confidered as fcales of feet and inches, or parts of either of them to be meafured in that manner, then the fcale of Roman figures, may be ufed with the greateft accuracy in the following manner.

EXAMPLE IV.

Fig. 4. To divide a line into feet, inches, and parts.

Let it be required to divide the line A B into a fcale of 10 feet, and one of thofe feet into 12 inches. By example I, divide A B into 10 equal parts, take one part A 1, and divide that alfo into 12 parts, by the lines of 60; then the fpace A 1 fet from 12 to 12 will give one inch, and the fpace from 1 to the center of the Sector being divided into 6 parts, will give 1-6th part of an inch; and thus fhall we obtain a fcale of feet, inches, and parts of an inch. If a fcale of more than ten feet be wanted, fuppofe 30, then, by taking 1-3d of the propofed line, and dividing that into ten, &c. we fhall obtain what is required.

EXAMPLE V.

FIG. 5. To make a ſcale of modules and minutes.

SUPPOSE A B is a given line, to be divided into 5 modules and 60 minutes; by the ſcale of Roman figures, viz. from the dotted lines under VI, VI, we may divide the line into 6 parts, as in the firſt example.

AND for the minutes, if the aſſigned length A C be not too ſhort to reach from 60 to 60, when the Sector is quite ſhut; then by ſetting the length of the line to thoſe numbers, and taking the diſtance from 1 to 1, we ſhould have at once what was wanted; but ſince the given line is too ſhort, we muſt therefore take a leſſer, but proportional number; ſuppoſe, the half of 60, which is 30, and make theſe numbers coincide with the compaſſes; then the half of the ſpace between 1, 1, and the center of the inſtrument, will be the 1-60th part of A C.——Or, having firſt divided the line A C into 30 parts, and then taking the half of one of thoſe parts, will anſwer the ſame purpoſe.

EXAMPLE VI.

FIG. 6. From three given numbers, viz. 8, 7, 5, to conſtruct a triangle.

TAKE any length, A B for the baſe, and ſet it from the dotted lines under VIII, VIII; keep the Sector fixed, and, in the ſame manner take the diſtance from VII to VII; fix one point of the compaſſes at A, and deſcribe an arc at C; then take the ſpace between V, V, and from the point B croſs the arc C; draw the lines A C, B C, and the thing propoſed is done.

EXAMPLE VII.

FIG. 7. To biſect an angle.

FROM A, with any radius, deſcribe the arc B C; take the ſpace B C, and divide it into two equal parts, by example I, and draw A D.

EXAMPLE VIII.

FIG. 8. From a given triangle, to make another of any proportion.

FIRST, From the triangle A B C, to make another a b c, that ſhall be a third part of it. Meaſure the lengths of all the ſides A B, A C, C D, by the inſtrument; thus, ſuppoſe A B is ſet from 15 to 15, on the ſcale of 60; the Sector remaining fixed, then A C and C B being equal, they will both coincide at 12, 12; draw a b at pleaſure, and take the diſtance from 5 to 5, and transfer it to a b; then take the ſpace from 4 to 4, and with that ſpace deſcribe the triangle, as in the ſixth example.

SECONDLY, From the triangle a b c, to make one which ſhall be 2-3ds bigger.

TAKE the length of a b, and ſet from 5 to 5; then make A B equal to the diſtance 15, 15, and A C, B C, each equal to 12, 12, &c.

EXAMPLE IX.

FIG. 9. To erect a perpendicular A C, by the inſtrument, from the point A of the line A B.

TAKE any length A a, and make it the diſtance of 30, 30; take the diſtance of 40, 40, and with it deſcribe the arc b, from the point A; then take the diſtance 50, 50, and from a in the ſame manner, croſs the arc at b; finally draw a line from A to b, and then A b is perpendicular to A b; for 3, 4, and 5, conſtitute a right angle, as well as any multiple of them.

EXAMPLE

EXAMPLE X.

Fig 10. From a given ſquare, to conſtruct another of any ſize.

The manner of doing this muſt be obvious, from the laſt example, and therefore needs no explanation.

EXAMPLE XI.

Fig. 11. To draw any irregular figure; and from a ſmaller, to conſtruct a larger.

Let A B C D E F be the given figure, and let it be required to contract it to 1-5th. Parallel to E D, draw e d at pleaſure; take the length of E D, and make it correſpond with 25, 25; let the Sector remain fixed, and make e d of the diſtance 5, 5; draw e f parallel to E F, and in the ſame manner make E F correſpond with the numbers 25, 25, and then e f with the ſpace 5, 5; and by repeating the operation for the remaining ſides, the figure will be compleated.

If it be required from a larger figure to draw a ſmaller one, take any ſide of the ſmall figure (ſuppoſe e d) and make it correſpond at 5, 5; then draw E D parallel to e d, which we make equal to 25, 25; and then proceeding as above directed, we ſhall do what was required.

EXAMPLE XII.

Fig. 12. From a large column A B, draw the ſmaller one a b to half the ſize of A B.

Take the length of A B, and divide it into two equal parts; make one of theſe parts the whole height of the column; then by the firſt face, third interval, ſecond bar, find the general heights, &c. And to produce a large column from a ſmall one already drawn, the proportion muſt be increaſed in the ſame manner.

EXAMPLE XIII.

Plate XXV. Fig. 1. To form a ſingle cornice.

Give A B for the propoſed height, and fix the inſtrument to the third bar, fourth interval, ſecond face, Tuſcan line, and try where the ſpace A B will coincide with correſponding numbers, viz. 30, 30, which number, thus obtained, muſt be kept to, as in the former examples; and thus ſhall we obtain the height of every member.

For the projections of the mouldings, we muſt go to the ſecond face, ſecond interval, fourth bar; upon which are the projections of the frieze and cornice; thus B D is the projection of the frieze only, and B G the total projection of the cornice.

EXAMPLE XIV.

Fig. 2. From the cornice A B C, Fig. 1, to make a ſmaller one; ſuppoſe 1-half leſs.

Divide A B of Fig. 1 into two equal parts; take the half of it, and try where it will correſpond with the numbers on the inſtrument, viz. 15 and 15; which is the number for drawing all the mouldings; and by keeping to the ſame numbers, and uſing the bar above-mentioned, we ſhall get the projections alſo.

It is hardly worth mentioning, that in the ſame manner, a large cornice may be taken from a ſmall one; the operation being only the reverſe of the other.

By theſe examples we may proportion a cornice to any given height; ſuppoſe, for inſtance, we would draw a cornice for a room of 14 feet high, ſo as to make it 1-16th part of this height.

Take the given height of the room, and ſet it from VIII to VIII, (the half of 16) take alſo the diſtance between the half of I and I on the Sector, viz. 2, 2, on the lines of 60, which is the total height of the cornice; and having obtained this, proceed as above directed.

EXAMPLE XV.

To vary the members.

As it may be neceſſary ſometimes to deviate from the ſtrict rules of putting invariably the ſame mouldings to the ſame parts of architecture, we will therefore ſhew how this may be perform'd by the inſtrument. Suppoſe, for inſtance, we would put the Attic, or Doric baſe, to the Corinthian Order.

Take the height of the given baſe, then ſet the Sector to the Doric baſe, and find the correſponding numbers; with which compleat the drawing.

In like manner, any other parts of an Order may be varied, with great facility and exactneſs.

EXAMPLE XVI.

Fig. 2 and 3. If we would leave out any particular member; ſuppoſe the ovolo.

Let it be required to leave out the ovolo of Fig. 2, and to form all the other members into a cornice, with ſimilar proportions as Fig. 3. Firſt, any where apart, draw a line parallel to A B, Fig. 2, viz. the lines 14, upon which mark off the heights of all the members except the ovolo. Secondly, give A B, Fig. 3. for the height of the propoſed cornice, which is of the ſame height as A B, Fig. 2. Thirdly, parallel to A B, Fig. 3, draw the lines 17, 17. Fourthly, upon the ſhorteſt, or outer line of Fig. 2, ſet off the heights of every moulding, but the ovolo, as it is done in the figure. Fifthly, take the ſhorter ſcale 17, and carry it to correſponding numbers on the Sector, ſuppoſe 20, 20, keeping it fixed. Sixthly, take the longeſt ſcale 1 to 7, or the given height A B, and ſee where it fits upon the Sector, viz. 25. Seventhly, by Example the 2d, increaſe the ſeveral parts upon the long ſcale, from thoſe of the ſhorter. If the deſcription of this paragraph ſhould appear prolix, yet the operation will ſhew the neceſſity of it; ſince by this means it becomes extremely eaſy.

But we muſt ſhew likewiſe, how to proportion the projections of the members.

In the firſt place, the projection of the cornice is made equal to it's height; which is ſet off from the point D to C.

Draw a line, c a, Fig. 2, from the end of the fillet, which ſhews the projection of the cyma; then make C a the diſtance of 20 to 20, and find the proportion of the height c a, which is 25 to 25; then make the height c a, Fig. 3, the diſtance of 25 to 25; and C a will be from 20 to 20. In the ſame manner find the other projections.

EXAMPLE XVII.

To determine the height of pediments.

The heights of this part of architecture being in a great meaſure arbitrary, we ſhall therefore principally regard the manner in which pediments are conſtructed.

And this being an article which we could not ſo regularly explain before, we for that reaſon have paſſed over the Ionic door within an arch, in the deſcription of that Order, and reſerved it for this place; and for the ſame reaſon, we have omitted to mention the Doric and Corinthian pediments over the doors, in plates XX and XXI. It has been ſhewn how arches are to be drawn by the Sector to all the five Orders; and the manner of placing doors within them is ſo very obvious, from what has been before advanced, that this article needs no further explanation.

Fig.

FIG. 4. For an angular pediment.

LET A 1 be the utmoſt length of the upper fillet to the cyma; divide it into 9 equal parts, by example I; then biſect A 1 in B, and draw the perpendicular C D; make B D equal to two parts of A 1, and draw A D and D 1; which will form what is called a pitched pediment. And for the compaſs pediment; biſect the line D 1 in E; from D and 1 with any radius, make the croſſing of the arcs at F, and from E draw E F through F, to cut D C in C; and then is C the center for deſcribing the pediment.

FIG. 5. Secondly, by another method.

BISECT A D in B, and draw the perpendicular C E; with the radius C A, deſcribe the arc A E, &c. and then is E the top of the pediment.

EXAMPLE XVIII.

FIG. 6 and 7. To vary the heights of the principal parts of an Order, and at the ſame time to preſerve the proportion of the ſeveral members.

IF A B is a given entablature, and C D the ſame height transferred for drawing of the other, which we will ſuppoſe is to be of the following proportions, viz. four parts for the cornice, three for the frieze, and three for the architrave; then divide C D (or E F) into 10 equal parts, which will determine the proportions required.

EXAMPLE XIX.

FIG. 8. To adapt a capital, baſe, &c. to a given trunk.

TAKE the total height, or projection of either of the parts; and then by the inſtrument, we may obtain proportional numbers to work with, and by this means be enabled to draw the part that is wanted.

EXAMPLE XX.

To meaſure the Orders, &c.

LET it be required to find the meaſures of any colonnade already drawn; ſuppoſing another was to be made in the ſame proportions, but of a different height to that repreſented by figure 8, and let the required height be 15 feet.

TAKE the height of the colonnade, and make the tranſverſe diſtance between XV, XV; fix both legs of the Sector with the ſcrews, then the tranſverſe diſtance of each member meaſured on the Sector will give the required meaſures.

To meaſure the Orders after a more exact manner.

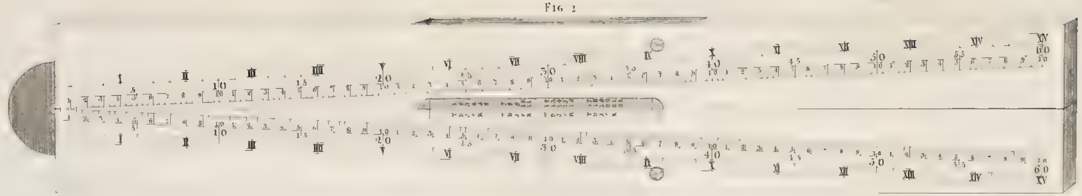
To meaſure an arch; draw a line as long as the inſtrument can contain within the open of the two legs, and mark all the heights upon this line with the inſtrument; then draw another line, and mark the projections; and by ſome of the foregoing methods, meaſure every member marked on theſe lines, and then transfer theſe meaſures to the ſmall draught, whence they will be more exactly meaſured than if they had been taken from the ſmall one.

But arches and archivaults muſt always be reduced as follows, viz. before the circumference can be meaſured, take the tranſverſe diſtance between 7, 7, or VII, VII, and alſo that at 11, 11, or XI, XI, mark theſe both apart, and keep them for a general rule, to meaſure the circumference of any arch or archivault of half a circle.

Then to meaſure the circumference of the arch, ſuppoſe the diameter; fit the tranſverſe diſtance of 7, 7, tranſverſly over 5 feet, 1-half, the ſuppoſed diameter of the arch; the inſtrument remaining thus ſet, take the tranſverſe diſtance of 11, 11, and ſee where that fits upon the Sector, which will give the circumference of the ſaid arch in feet and inches.

By the ſame rule any room may be meaſured.

Fig 2



The Architectonick Sector
First Face

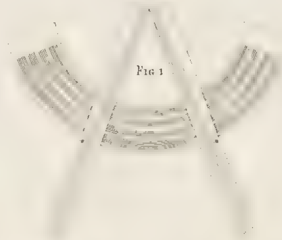


Fig 1

Made by Geo. Adams in Fleet Street London
Mathematical Instrument Maker
To His Royal Highness the PRINCE of WALES

Fig 3

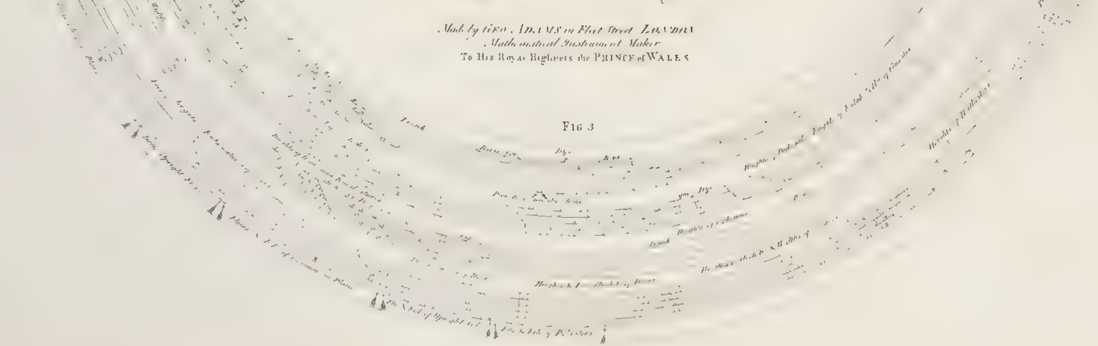
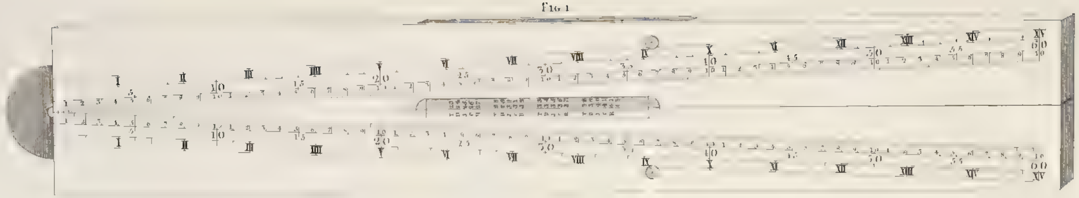


Fig 1



THE ARCHITECTONICK SECTOR
SECOND FACE

Fig 2

Plate III.

Tuscan Arches and Colonnades

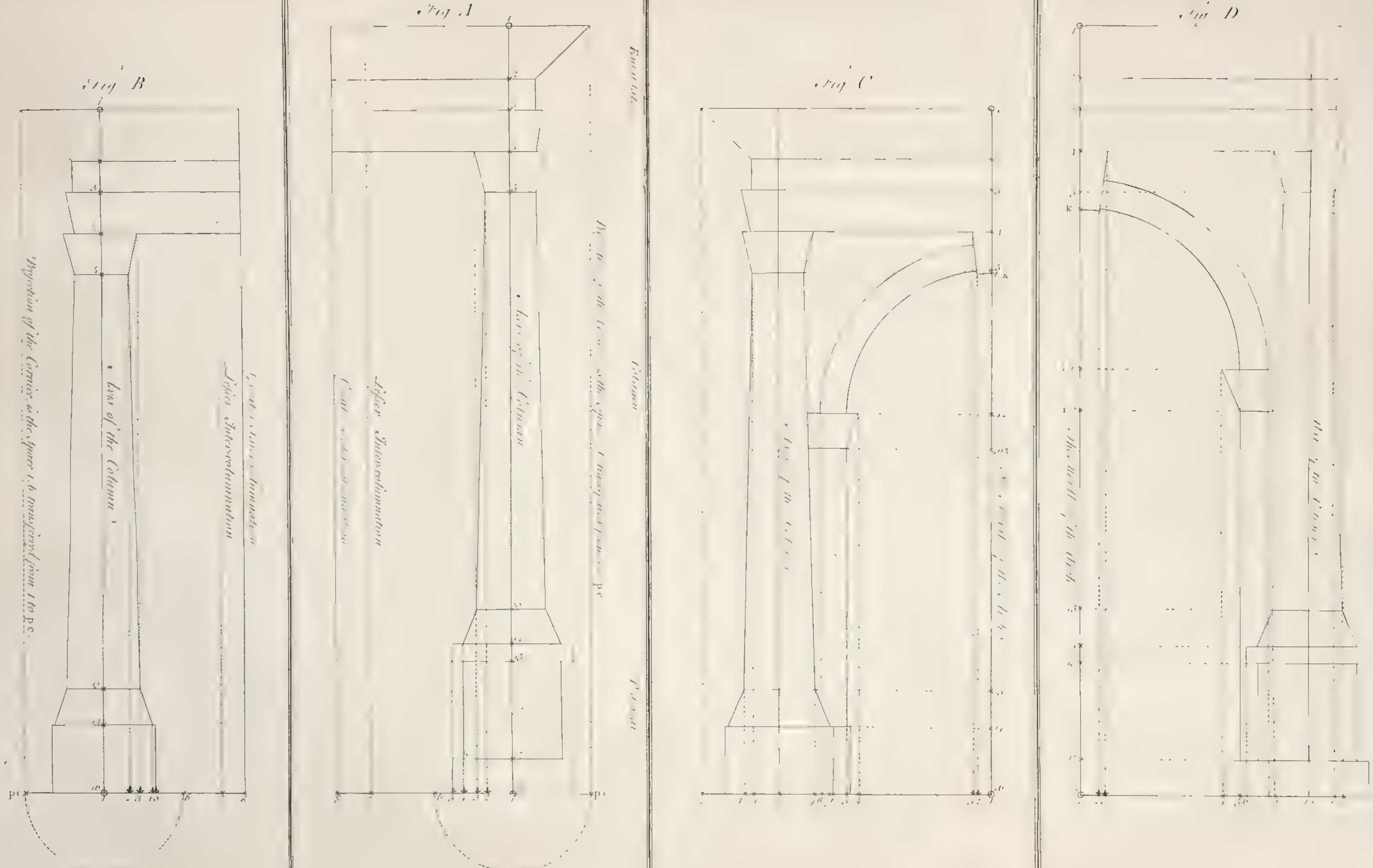


Plate IIII.

Tuscan Order.

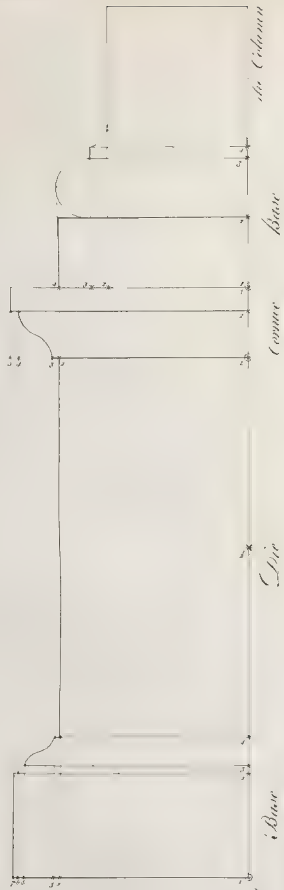


Fig. A

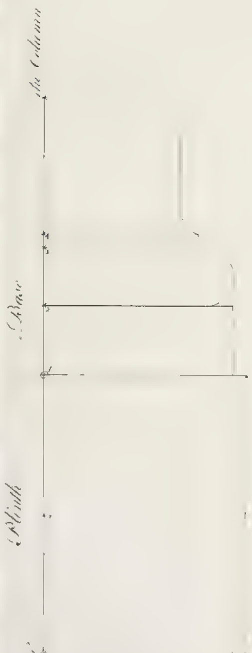


Fig. B

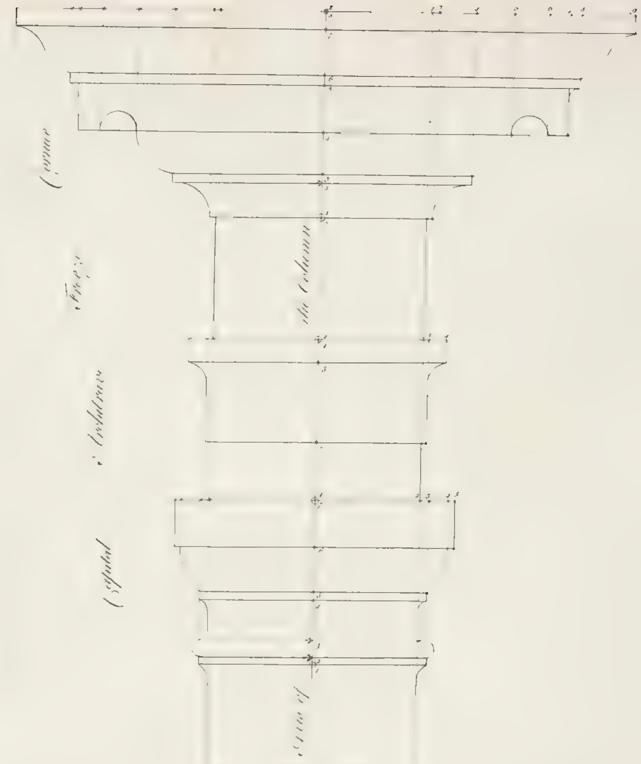


Fig. C

Plate V.

Doric Colonnades and Arches

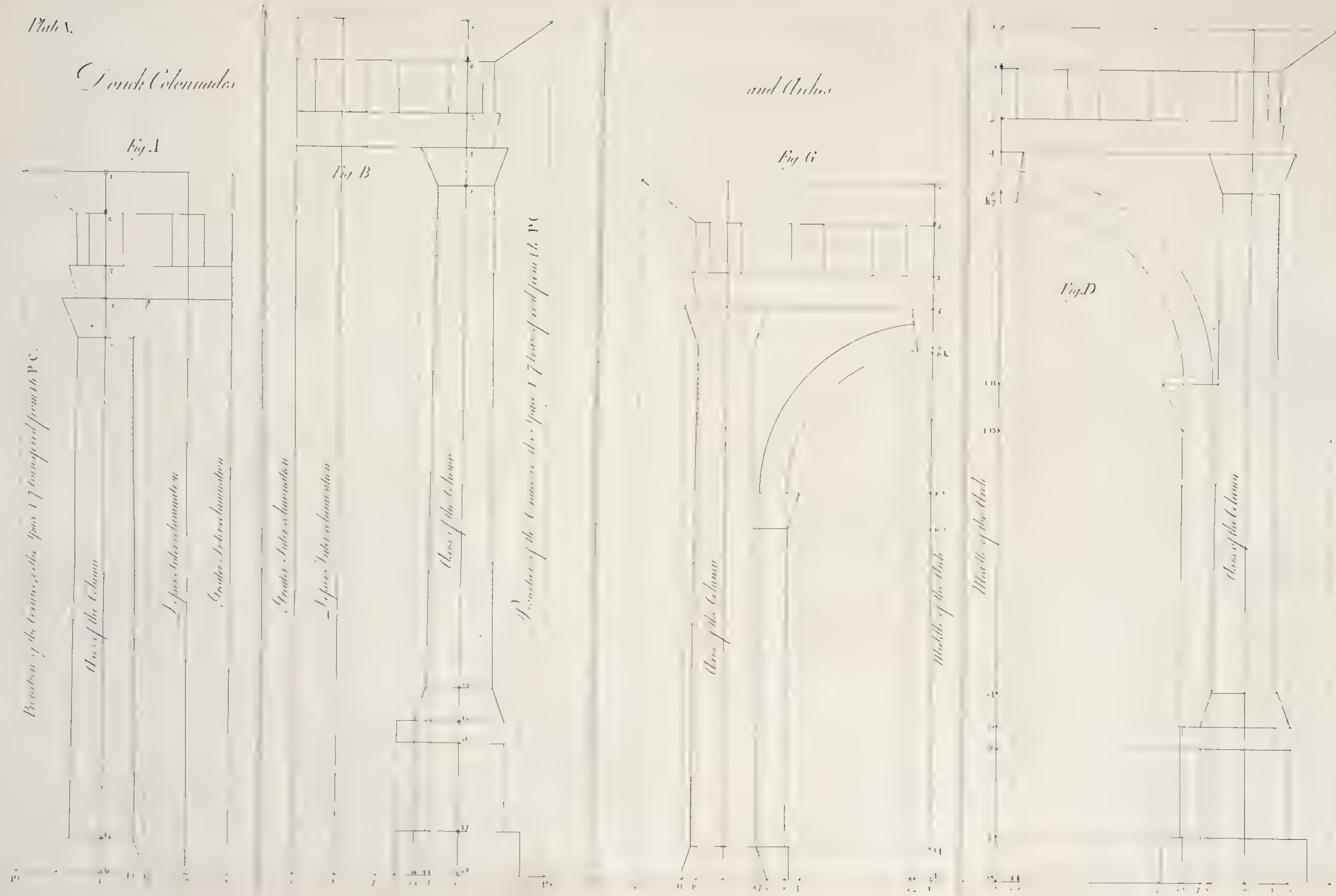
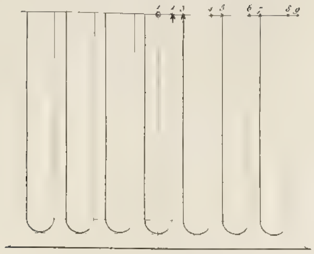


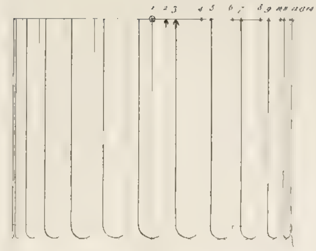
Plate VI

Fig. 3

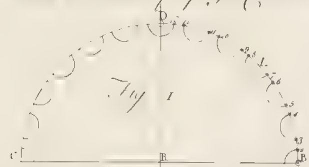


Flutes & Fillets of Pilasters

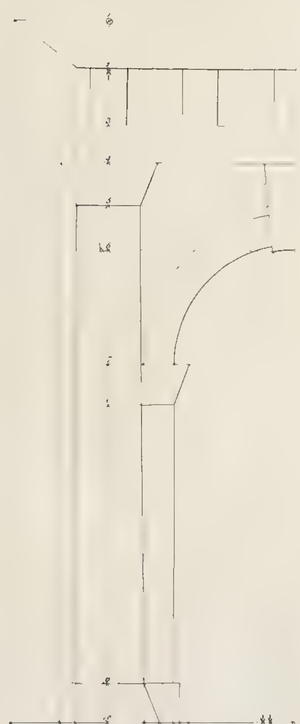
Fig. 2



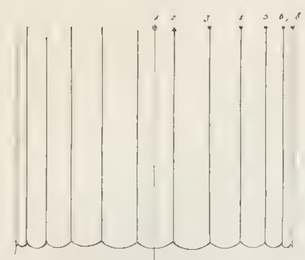
Flutes & Fillets of Upright Columns



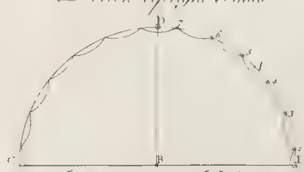
Flutes & Fillets of Columns in Plane



Dorick lesser Arch.



Dorick Upright Flutes



Dorick Flutes in Plane

Plate XII

Dorick Order

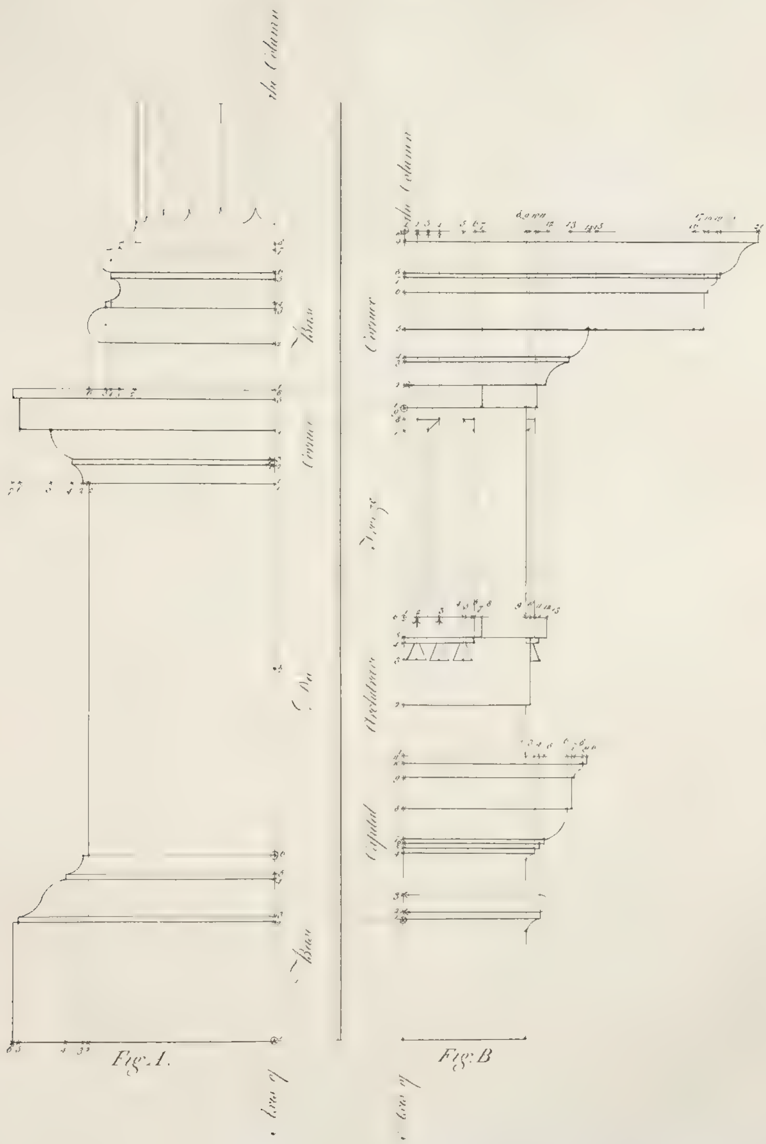


Fig. A. Fig. B

J. Gwynn delin

Js. Hazell sculpt

Ionick — Colonnades

Fig. A

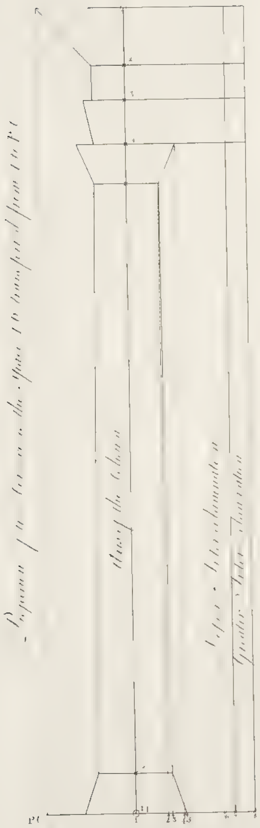
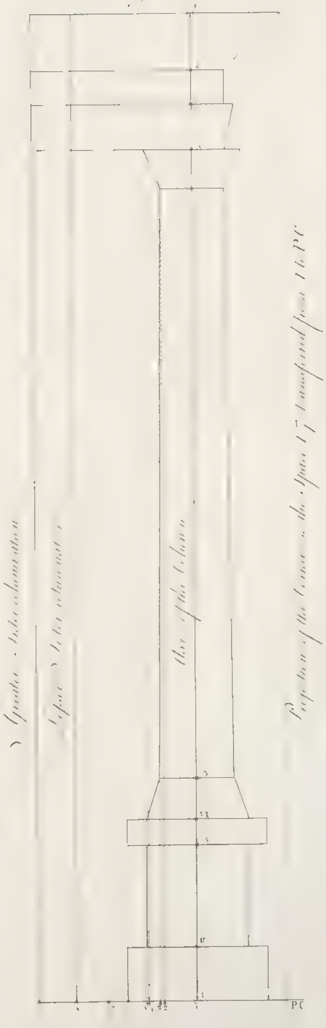


Fig. B



Jn. F. ... sculp.

Plate IX

Ionic Arches.

Fig. B

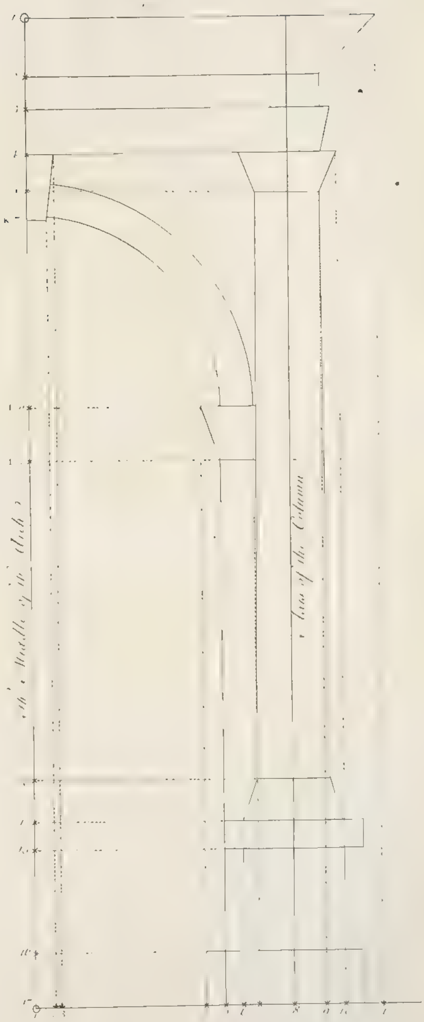
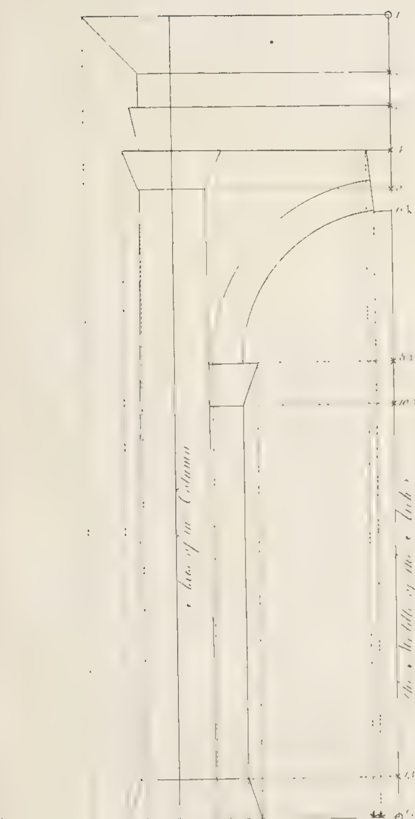
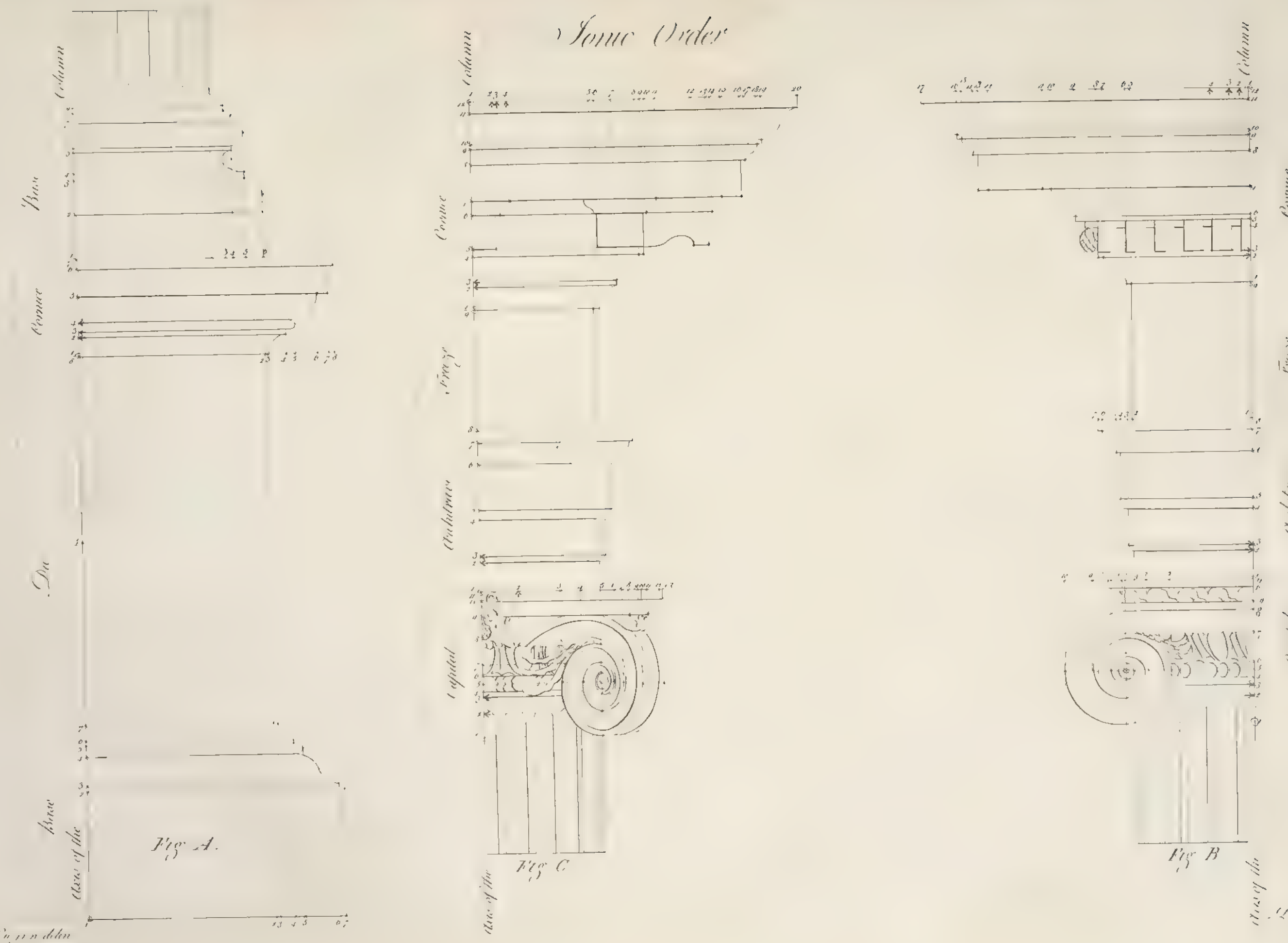


Fig. A



Ionic Order



J. Gwynn delin.   P. Mazell sculp.

Plate. XI

Corinthian Colonnades

Fig. A

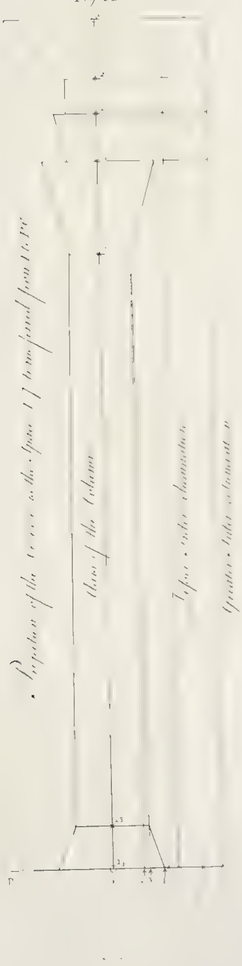


Fig. B

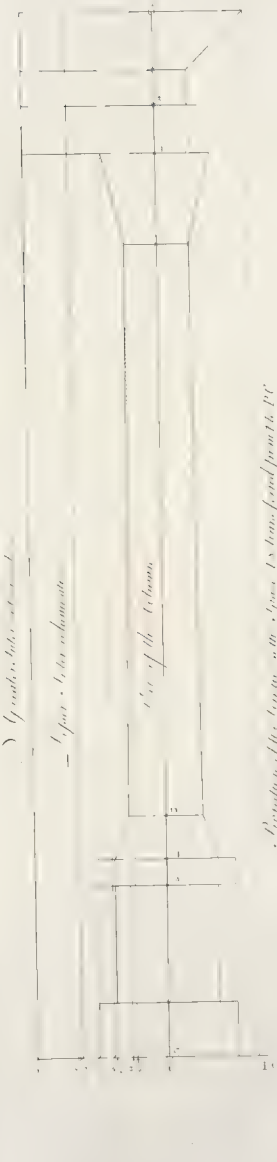


Plate XII

Corinthian Arches

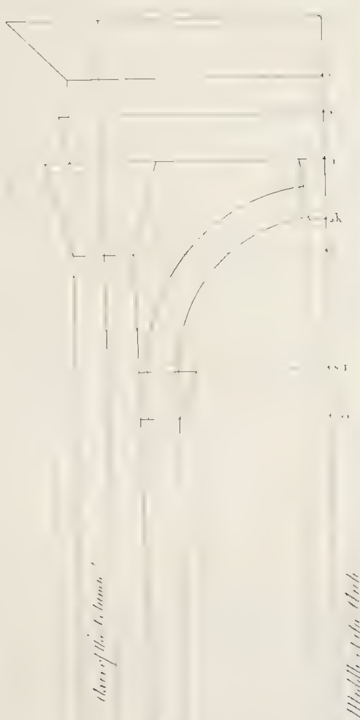
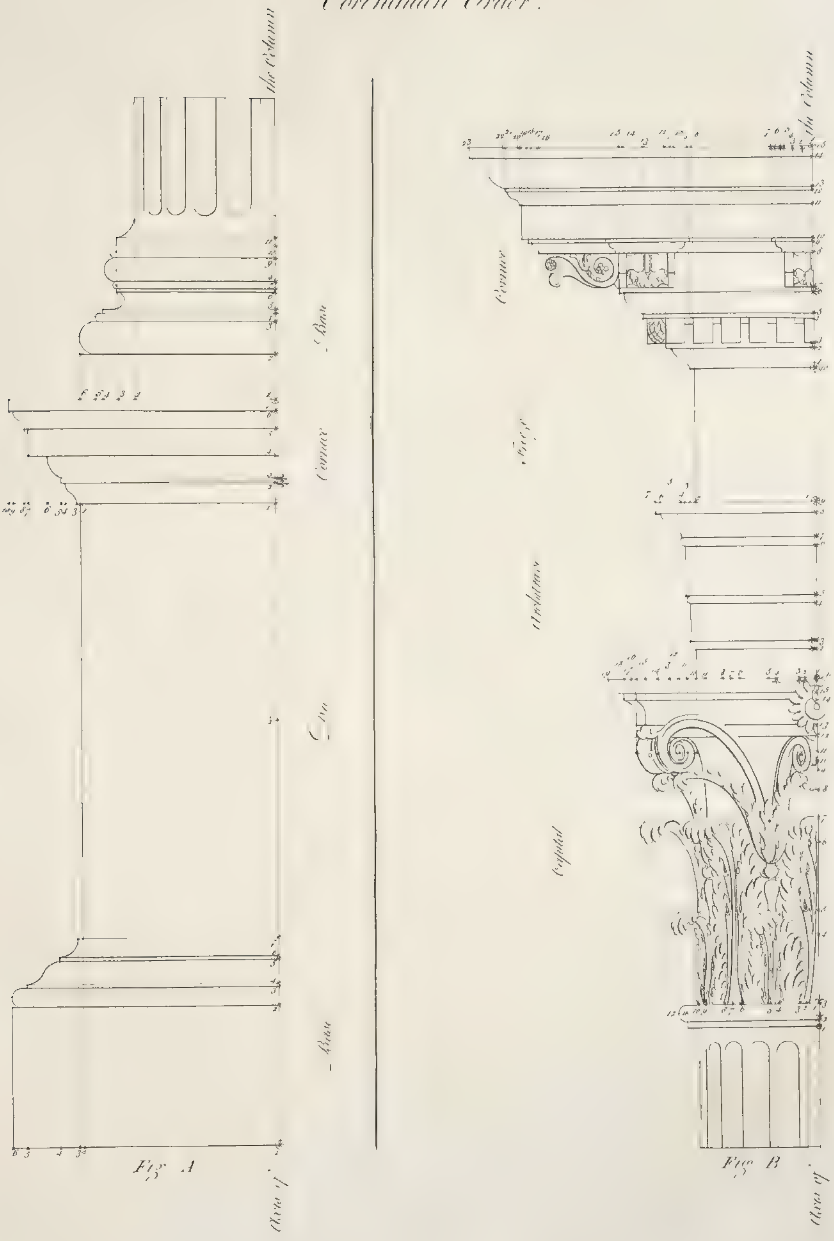


Fig A

Fig B

Plate XIII.

Corinthian Order.



J. Gwynn delin *P. Mazell sculp*

Plate XIV

Composite Colonnades

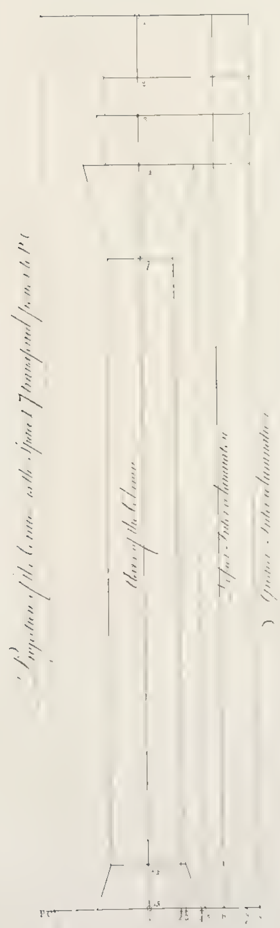


Fig. A

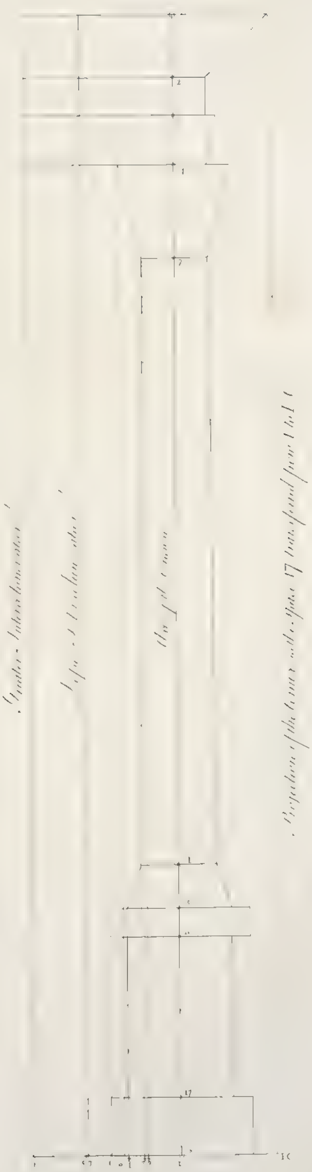


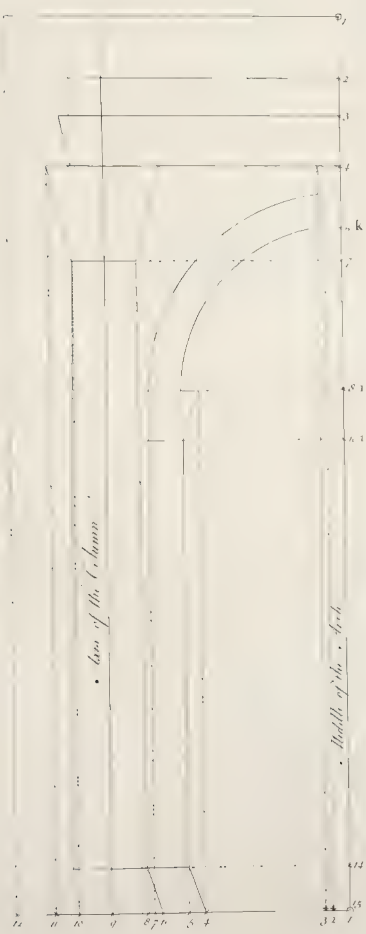
Fig. B

Plate XV

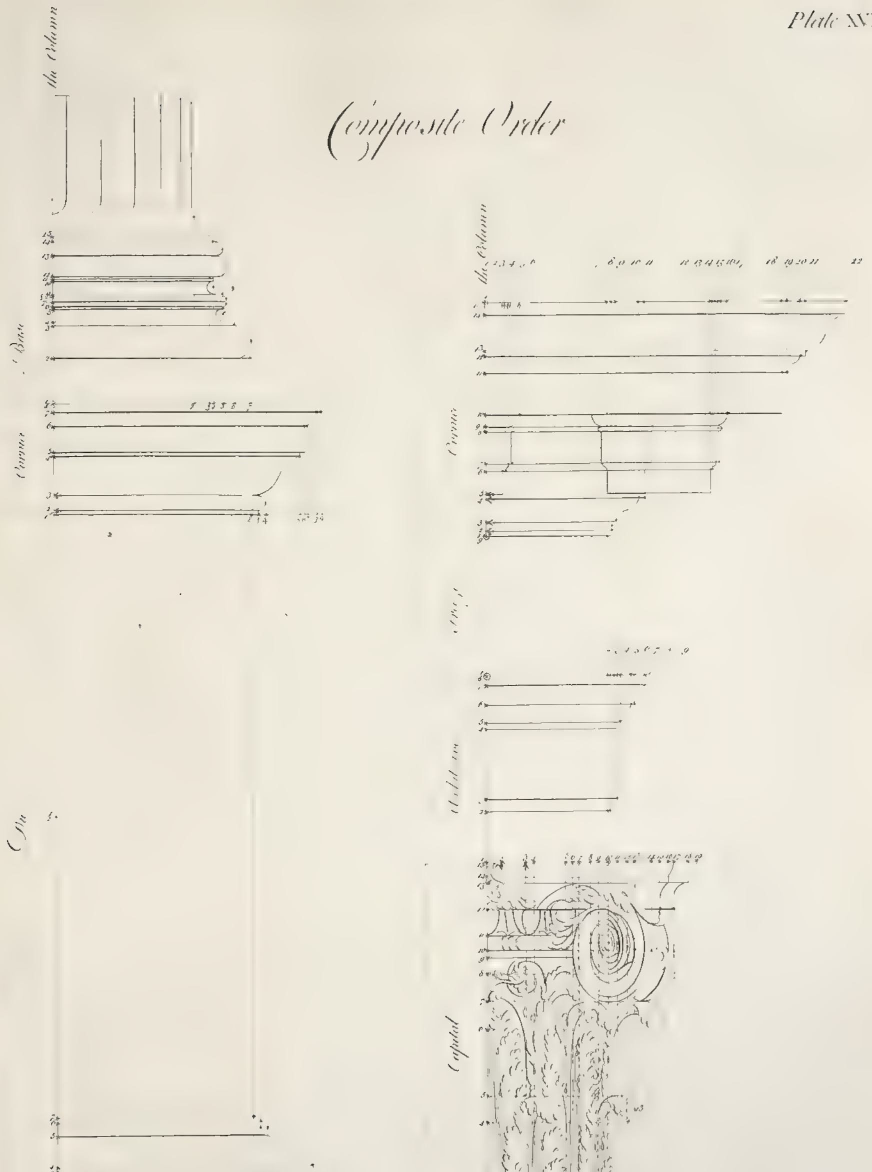
Composite Arches.

Fig. B

Fig. A

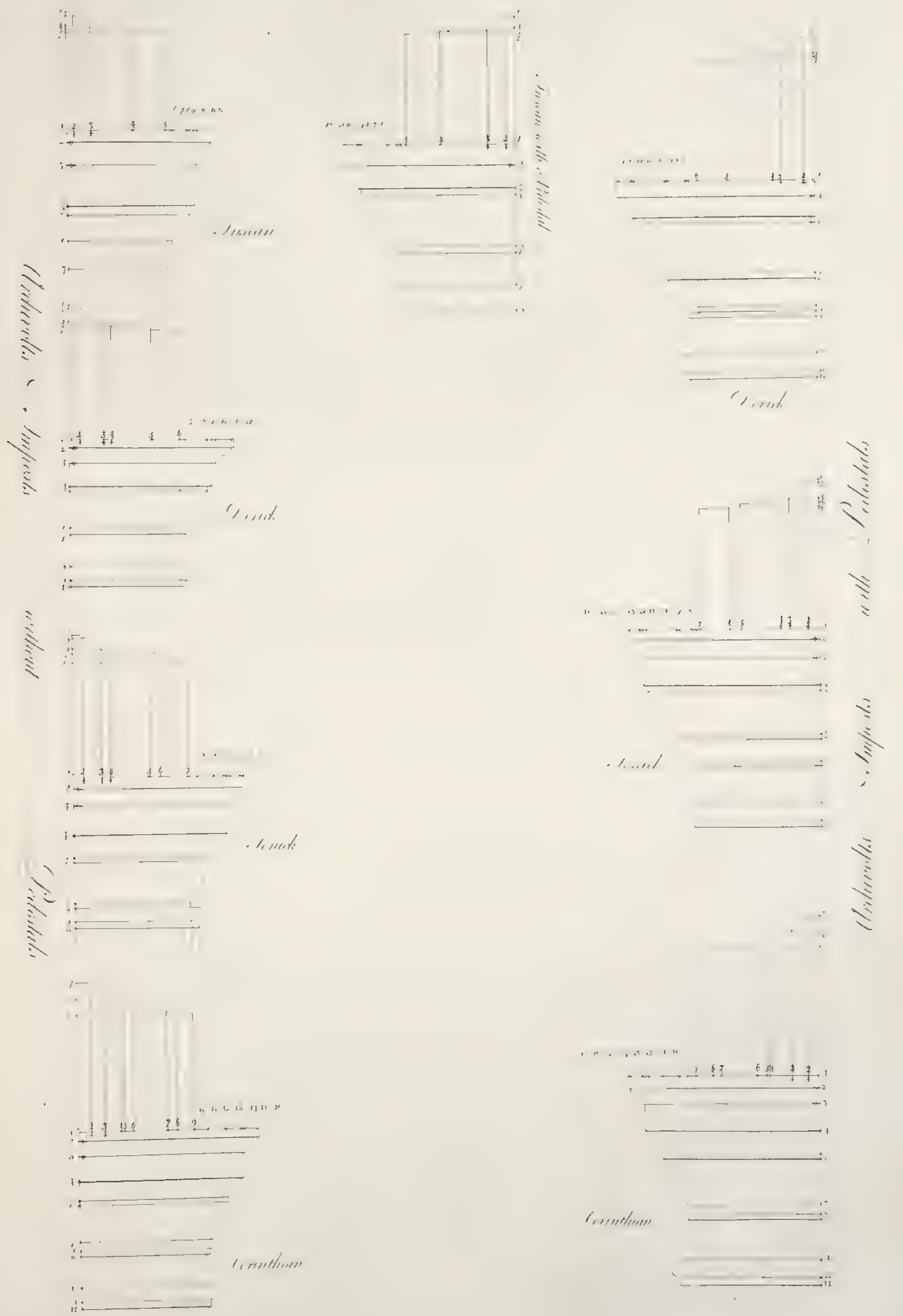


Composite Order



P. Mazell sculp.

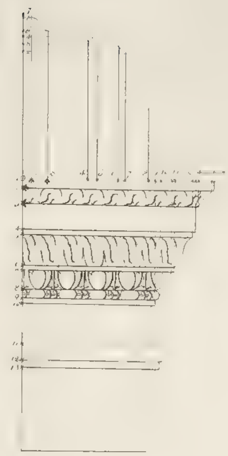
Plate XVII



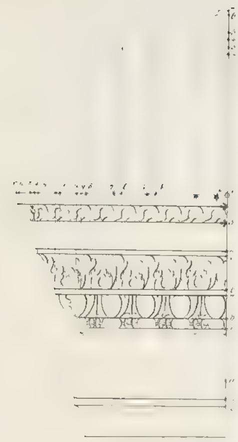
Archivolts & Imposts without Pedestals
Tuscan
Doric
Ionick
Corinthian
Tuscan with Pedestal
Archivolts & Imposts with Pedestals
Doric
Ionick
Corinthian

Plate XVIII.

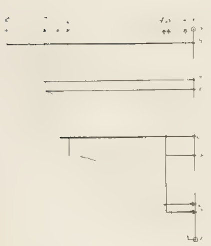
Composite Archivolt & Impost without a Pedestal



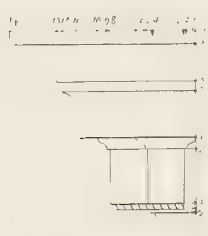
Composite Archivolt & Impost with a Pedestal



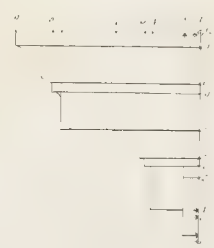
Tuscan



Dorick

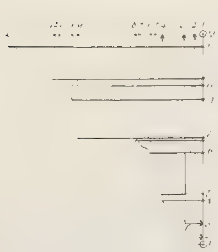


Ionick



Block Cornices

Corinthian



Composite

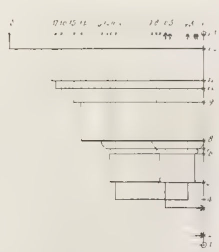


Plate XIX.

Ballusters

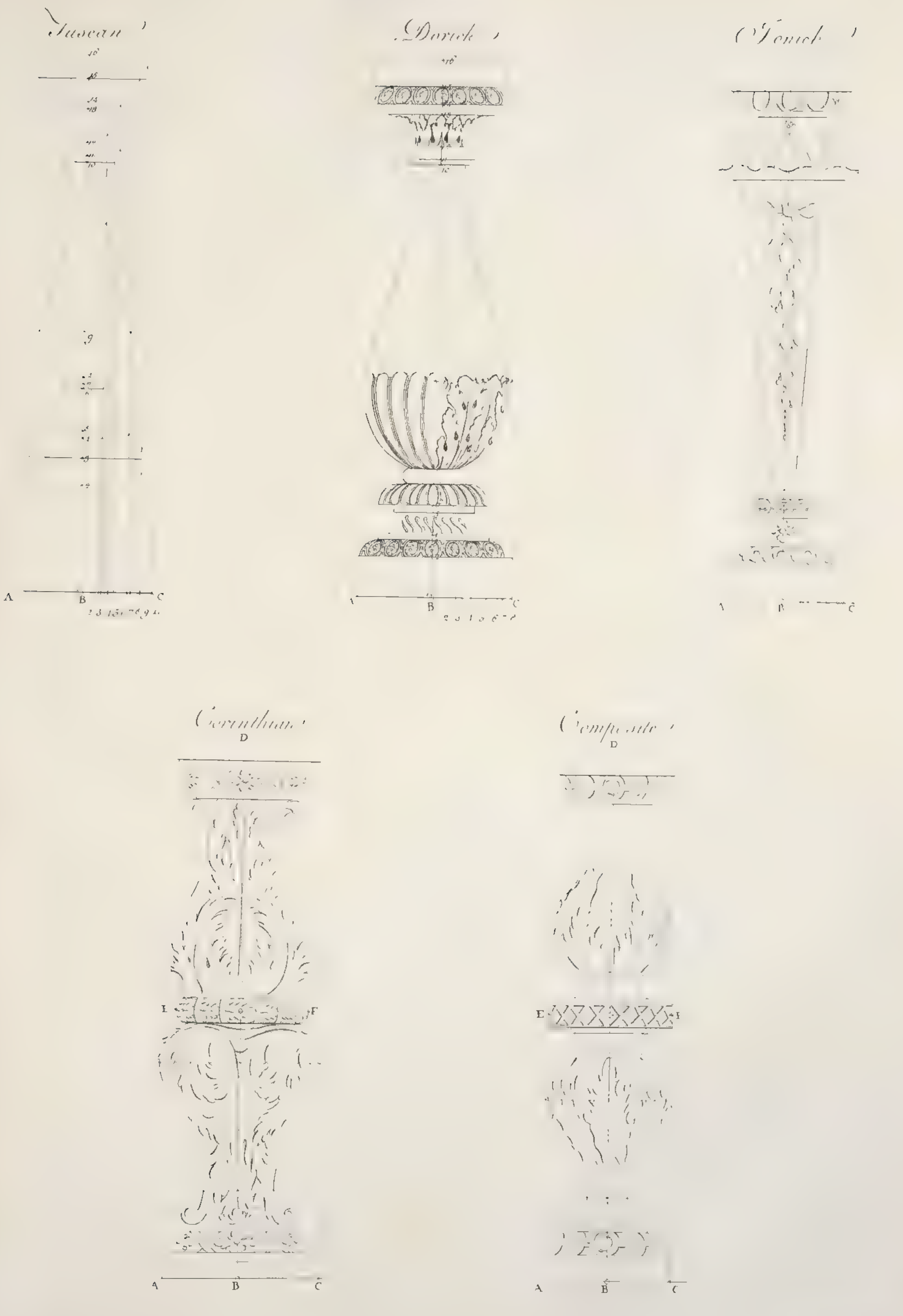


Plate XX.

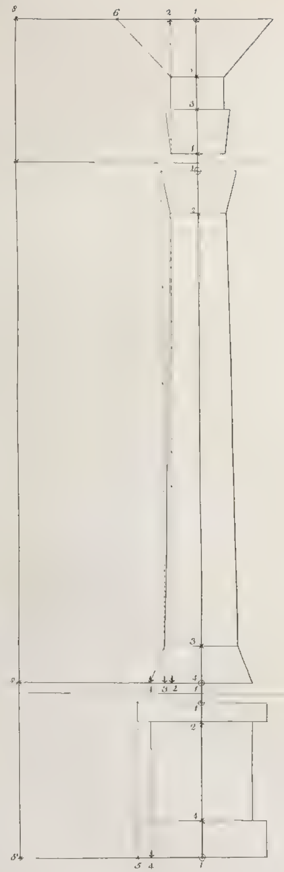


Fig. 1.

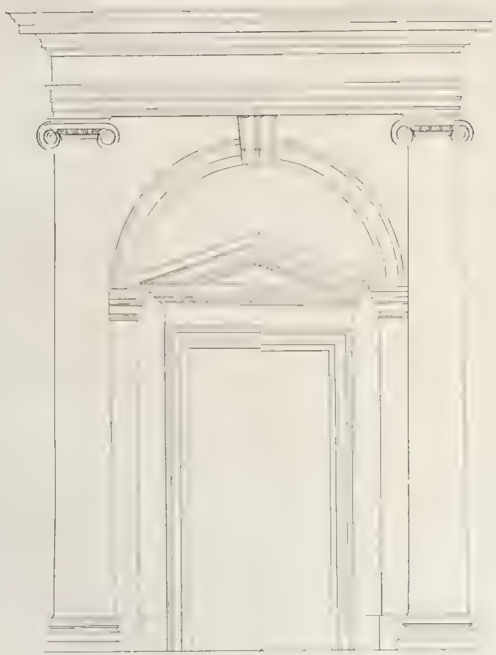
Fig. 2.

Tuscan Door

Fig. 3

Doric Door with a Pediment & Consoles

Plate XXI



An Ionick Arch with Door

Fig. 1

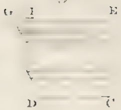


Fig. B

Corinthian Door

Plate XXII


Tuscan
Dorick
Entablatures for Doors.
Ionick
Corinthian
Composite

Consoles

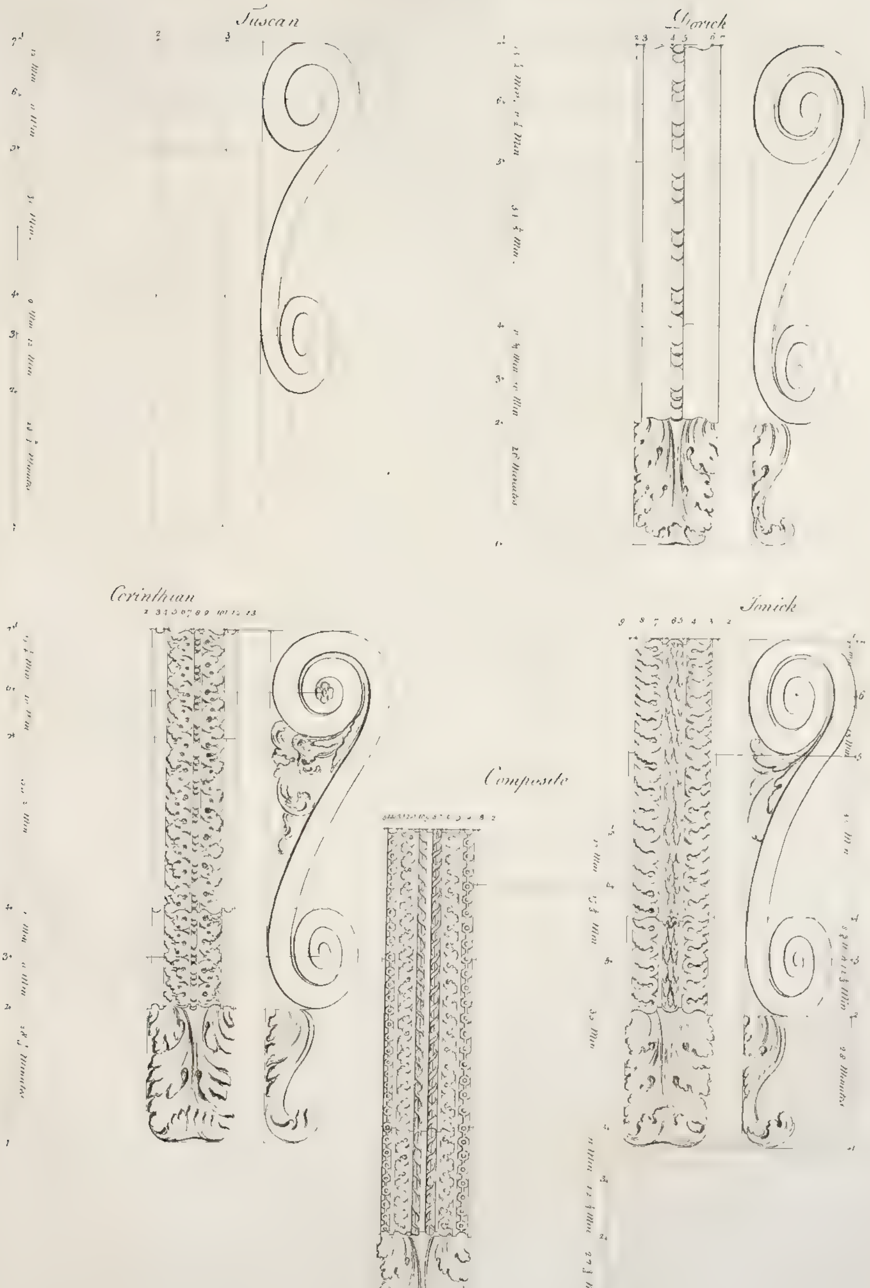


Plate XXIV.

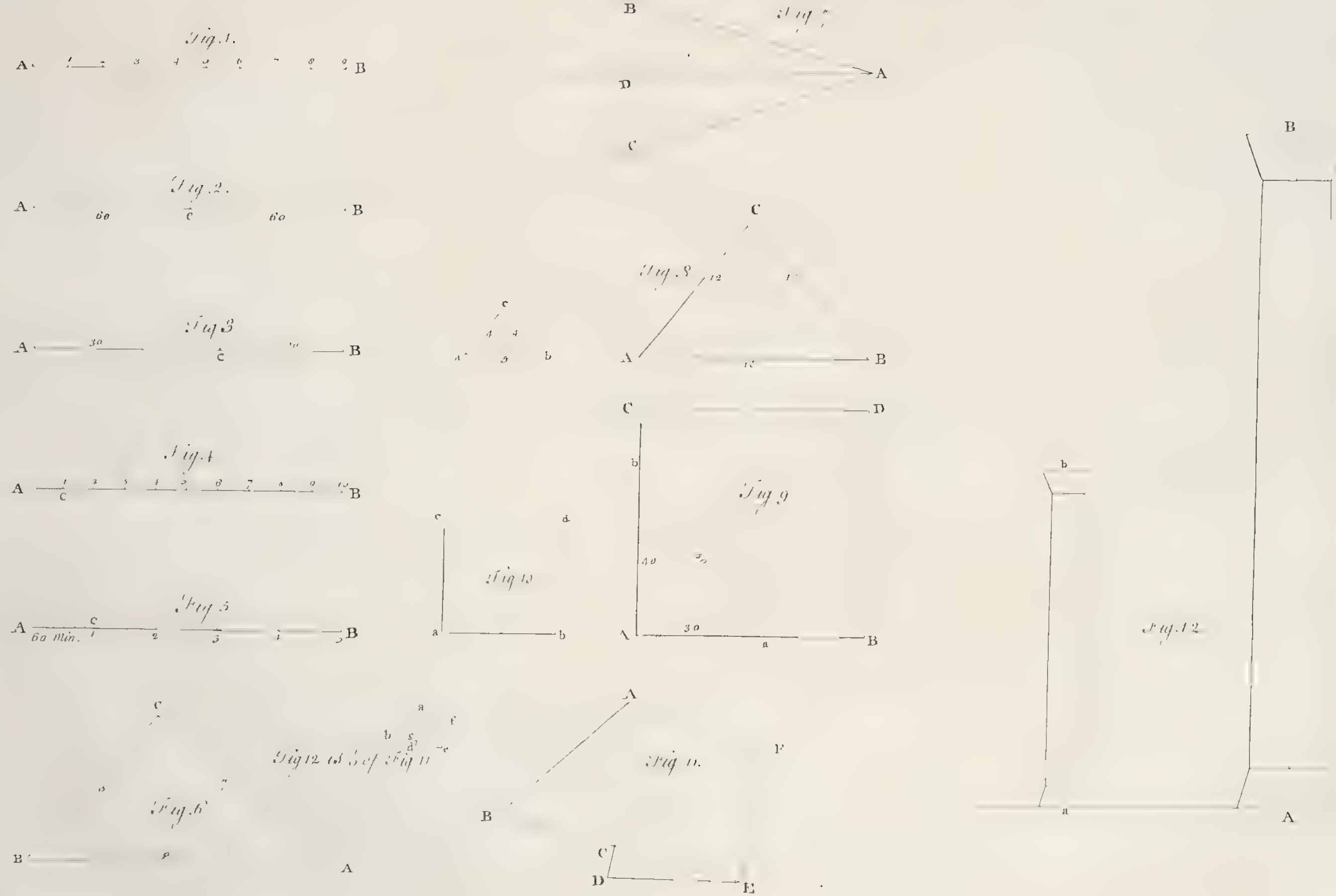
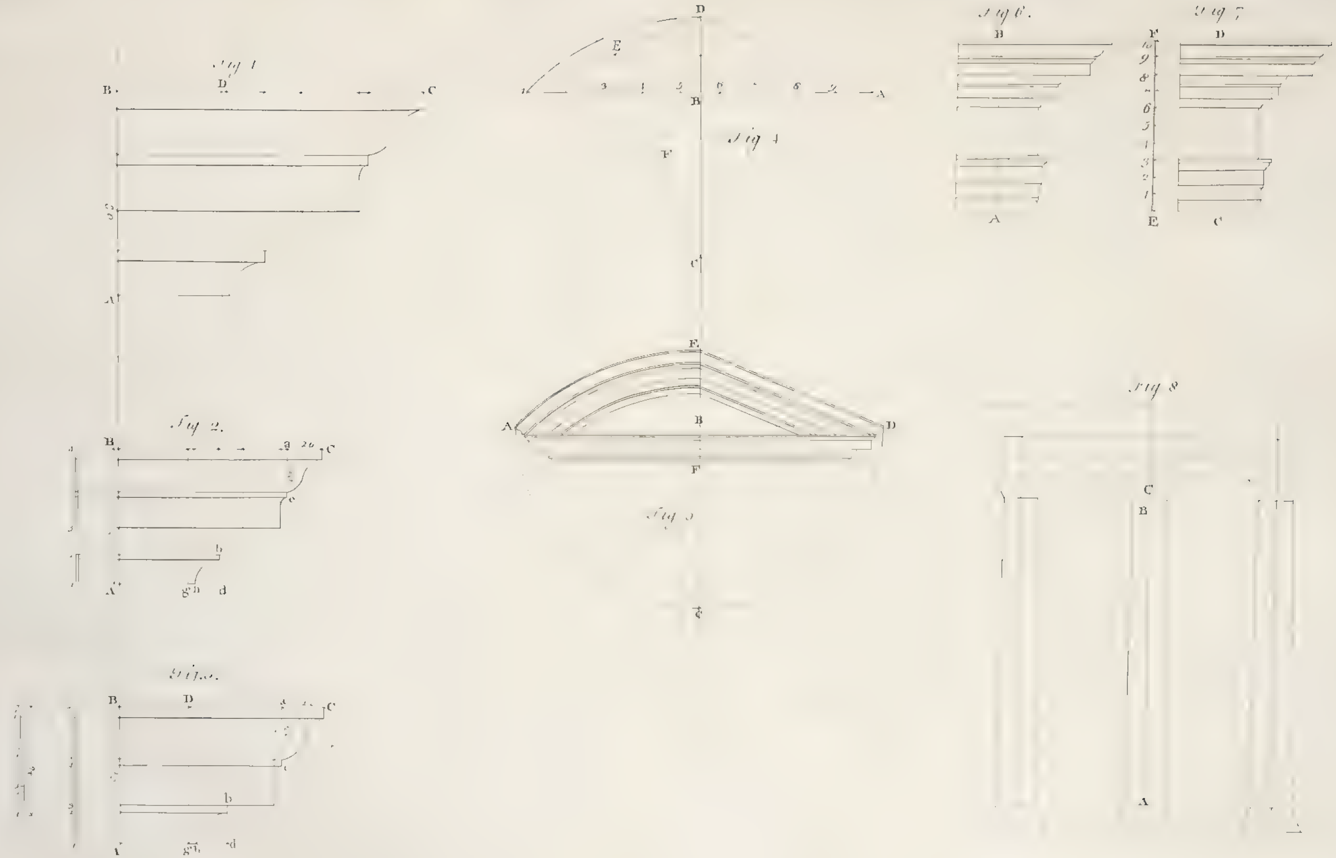


Fig. 1.
Fig. 2.
Fig. 3
Fig. 4
Fig. 5
Fig. 6
Fig. 7
Fig. 8
Fig. 9
Fig. 10
Fig. 11.
Fig. 12
Fig 12 & 3 of Fig 11
60 Min.

Plate XXV



THE

PERSPECTIVE

OF

ARCHITECTURE.

A WORK ENTIRELY NEW;

Deduced from the PRINCIPLES of

DR. BROOK TAYLOR;

And performed by

Two RULES only of Univerſal Application.

BEGUN

By Command of His preſent MAJESTY,

WHEN

PRINCE of WALES.

BY

JOSHUA KIRBY,

Deſigner in Perſpective to His MAJESTY.

PART THE SECOND.

PRINTED FOR THE AUTHOR.

INTRODUCTION.

MEN have been led into the moſt uſeful diſcoveries, either by attending to the common phœnomena of nature, or by experimental deductions, or elſe by reaſoning on ſimple and general principles.

The beſt method for inveſtigating the perſpective of architecture ſeems to be this, viz. to bring before the mind the various forms of buildings; to ſort, or arrange them into ſeveral claſſes; in order to obtain ſuch rules for practice as may be eaſily comprehended and made univerſal in their applications. For, if clear ideas are once obtained, and we can form from them a ſet of principles which are eaſy, determinate, and comprehenſive; then, by the power of language we can readily convey thoſe thoughts to others, if we uſe common and expreſs terms for each idea, and lay them in the ſame order as they are placed in our own minds. 'Tis owing to the want of ſuch a regular manner of inveſtigation, that many authors on this ſubject have miſſed the point they aimed at. They drew out Plans and Elevations for every example, and made uſe of innumerable lines and points, even for the moſt ſimple Buildings, which muſt neceſſarily have perplexed themſelves, and embarraſſed thoſe they intended to inſtruct. But it ſhall be our buſineſs to ſtrike into a new path, and endeavour to eſtabliſh ſuch principles for this part of perſpective as ſhall have a rational theory, and fully anſwer the end propoſed by them. In order to do which, we will begin in a regular manner, and go on ſtep by ſtep, till we have fully illuſtrated whatever we ſhall advance.

All viſible objects, in reſpect to their ſize, ſhape, colour, &c. convey the ſame kind of ideas to different perſons. In nature, theſe characters or marks of figures are infinite; but in works of art they are limited and confined within a much narrower compaſs than is generally apprehended; and particularly ſo in the geometrical forms or ſhapes given to architecture. And therefore, in order to draw the repreſentation of any building, it becomes neceſſary to know, in the firſt place, what it is that marks or characteriſes the whole; and ſecondly, to conſider very attentively its ſeveral conſtituent parts, in a regular and progreſſive manner.

The moſt general forms of architecture may be comprehended under the Triangle, the Square, and the Circle; and the ſeveral parts, which conſtitute a compleat order, (a very few excepted) are of a ſimilar conſtruction with thoſe geometrical figures.

All thoſe lines that are boundaries to the ſeveral parts of Architecture, are either ſtraight or circular; and therefore thoſe two different kind of lines variouſly applied, may be ſaid to conſtitute the principal parts of an order.

In

In like manner, Buildings are either terminated by given angles, or by circular out-lines, consequently to reduce a circle or any given angle into perſpective is all that ſeems neceſſary for drawing the repreſentations of ſuch Buildings; for if the body of an edifice be a cube or parallelopipedon, it's angles are right ones; if a priſm, it's angles are acute; and if a polygon, then it's angles are obtuſe; but if a cone or cylinder, then the plan is a circle; and ſo alſo if the Building be a mix'd one, that is, partly triangular, partly ſquare, and partly circular; then the perſpective of it is to be obtained by the ſame rules, and with little more trouble than is required in drawing thoſe, which are leſs complex.

An order of architecture (as to it's mouldings only) may be conſidered as a number of ſquare and circular horizontal planes, of different diameters, laid in ſuch a manner upon one another, as to give the peculiar ſhape or outline of each; and therefore to put the ſeveral mouldings into perſpective, nothing more ſeems neceſſary than two general or univerſal rules, viz. one for drawing the repreſentation of a ſquare, and the other that of a circle: and theſe we have deduced from the principles of Dr. Brook Taylor, in his Linear Perſpective, and we have moreover fully explained it in the beginning of this work.

Again, the ſeeming great variety of mouldings, of which an order of architecture is compoſed, is reducible to ſeven only, viz. the Plinth, the Torus, the Ovolo, the Cincture, the Cyma, the Cavetto and the Scotia; as for the Ionic, the Corinthian and Compoſite capitals, the Doric Triglyphs, Modilions, Dentals, &c. their repreſentations may be determined by the ſame rules a little varied in their applications.

In putting the orders into perſpective, we have uſed the ſame method for the heights and widths as architects do in drawing elevations only; which manner of working will make each operation more eaſily underſtood, and more univerſally extenſive.

Thus much, we apprehend, is ſufficient for conveying a general idea of our deſign in the following work. We will now give a ſhort abſtract of the contents of it, and then proceed with as much order and brevity, as the nature of the ſubject will admit of.

This volume is divided into four books, and each of theſe into ſeveral ſections. In the firſt book we have given a few ſimple, but general rules. In the ſecond book we have ſhewn how, with theſe rules, to put all the five orders of architecture into perſpective. The third book relates wholly to the doctrine of light and ſhadow, which explains this part of perſpective in a new and familiar manner. In the fourth and laſt book, we have ſhewn the application of our general rules, beginning with ſimple colonnades, and ending with elegant ſtructures; and with theſe we finiſh what was principally intended; however, this, in order to make the work yet more compleat, ſhall be followed by another volume, if we are ſo fortunate as to meet with the public approbation.

THE

PERSPECTIVE

OF

ARCHITECTURE.

BOOK I.

CHAP. I. SECTION I.

Of preparing the Picture, viz. the aſſuming a proper Diſtance, and Height for the Eye.

AMIDST the infinite variety of beauty, obſervable in the works of nature, there are ſome forms or ſhapes which ſeem ſo nicely adapted to the feelings of our own minds, as to excite in us the moſt pleaſing and agreeable ſenſations: and there are others of an oppoſite, or indelicate nature, that obtrude themſelves upon us like diſagreeable companions, and give a degree of pain inſtead of pleaſure. But from what cauſe this really ariſes, I will not take upon me to determine; it is a ſubject which has long employed the pens of ſome learned and ingenious men, and perhaps no one of them has attempted it with more ſucceſs than my very worthy and ingenious friend Mr. HOGARTH, in his Analyſis of Beauty; and after ſo judicious and excellent an artiſt, it would be preſumption in me even to attempt it: however, I may, in this place, venture to aſſert, that in drawing the perſpective repreſentation of any object, the utmoſt care ſhould be taken to avoid diſagreeable or unatural forms, and eſpecially thoſe which would in general be diſpleaſing.

In order to do which, we muſt firſt fix upon a proper diſtance and height for the eye, for if the diſtance be too ſmall, the apparent lengths will be too long; and the contrary, when the diſtance is too great: and the ſame bad effects will follow, if the heights for the eye be improperly choſen. ‡

I.

‡ Because the method by which rules for calculating perſpective repreſentations are mathematically inveſtigated, could not properly be introduced in the body of this work, it was thought neceſſary to ſubjoin the ſame by way of note, as contained in the following remark. For this, and ſome other remarks of the ſame kind, inſerted by way of note, it is but juſtice to acknowledge myſelf indebted to the friendly aſſiſtance of Mr. Cowley, Mathematical-maſter, of Bell-Savage-Yard, Ludgate-Hill.

R E M A R K.

This variety of poſitions, which the eye may aſſume, is a circumſtance peculiar to ſcenographical or perſpective repreſentations; for in the other kinds of projection it is confined to one that is unalterable. The place of the eye is alſo a characteriſtic by which the different ſpecies of projection may be diſtinguiſhed. Thus, for inſtance, when the eye is conſidered as being at an infinite diſtance from the plane of projection, that is, the plane on which the required repreſentations are to be drawn, which in perſpective is termed the picture, it is called orthographic projection. When the eye is conceived as being only ninety degrees diſtant from the plane of projection, or in the pole thereof, it is called ſtereographic projection; and when placed at the center, the projection is named Gnomonical: this laſt is the foundation of dialing. The orthographical and ſtereographical projections, were contrived by the ancient aſtronomers, for their eaſe in aſtronomical affairs, and are particularly adapted to the projection of the ſphere, and its ſeveral circles in plano. By the orthographical projection, a circle that is perpendicular to the plane of projection is repreſented by a right line equal to the diameter thereof: in the ſtereographic, its repreſentation is a right line, which is infinitely extended both ways from the center of projection; and by the ſcenographical projection, it is repreſented by a line, which is either longer or ſhorter, according as the eye is nearer or farther off. Hence it appears, that, generally ſpeaking, there are only four varieties in the poſitions that may be aſſigned to the eye; that is, it may either be at an infinite diſtance from the plane of projection, in the pole, or in the center thereof; or laſtly, at ſuch a due diſtance as is ſuitable for diſtinct viſion. The laſt caſe belongs to perſpective, and admits of ſome variety, as was obſerved above; now whether the eye be conſidered as being on, or any where within the ſurface of the ſphere, the circle before deſcribed will ſtill be projected into a right line, extending itſelf on both ſides thereof. This, and the ſeveral other aſſertions here delivered, concerning the different repreſentations which are produced by theſe ſeveral projections, may be ſeen demonſtrated by thoſe authors who have treated on them in the mathematical way. The doctrine of projection may therefore, in general, be conſidered as conſiſting of three diſtinct branches, whoſe firſt principles are eſſentially different, and by which the whole of any object may be repreſented upon the ſame plane, viz. Orthographics, ſtereographics, and ſcenographics, commonly ſtiled Perſpective. Having thus briefly ſpecified the principles of theſe ſeveral kinds of projection, and ſhewn wherein they eſſentially differ from each other, it remains that we now proceed to the main deſign intended by this remark, which is to explain more particularly the nature of perſpective, or that part of mathematical projection which is concerned in inveſtigating rules for producing repreſentations proper to the various objects, poſitions, and the ſeveral other particularities which are herein conſidered. Now ſeeing that ſolids when repreſented on a plane can there be ſhewn only by ſurfaces, that ſurfaces are reſolvable into lines, and lines into points, it follows, that the theory, or mathematical part of perſpective, may be ſaid to depend chiefly on a true and general ſolution of the following.

P R O B L E M.

A plane being given, the poſition of a point out of that plane, and the place of the eye being given; to find upon that plane the apparent poſition of that given point.

The ſolving this problem will be found of ſingular advantage in eſtabliſhing the theory of perſpective; for the apparent poſition or perſpective repreſentation of a point being determined, that of lines (they being terminated by points, ſurfaces as contained under lines, and ſolids, becauſe bounded by ſurfaces) will follow as ſo many corollaries evidently reſulting from it. The rules which mathematicians give for producing perſpective repreſentations, have therefore their origin, or are primarily deduced from hence. But becauſe the poſition of an object cannot be determined otherwiſe than by comparing it with ſome other object, whoſe ſituation is given, therefore it is, that in the caſe before us, beſides the plane given in the problem, two other planes are aſſumed which ſerve for terms of compariſon. The given plane, now called the picture, exhibits the repreſentations of the ſeveral objects whoſe perſpective forms are required, according to their reſpective diſtances from each other. Of the two aſſumed planes, one is to be conceived as a level plane, perpendicular to the picture, and parallel to the horizon: this plane enables us to diſtinguiſh the poſition of objects, with reſpect to higher and lower, and is therefore called the horizontal plane: and the other aſſumed plane aſſiſts our perception, by pointing out to us the place of objects, with reſpect to their being on the right hand, or on the left. This laſt-mentioned plane is perpendicular both to the picture, and alſo to the horizontal plane, and is therefore called a vertical plane; ſee an illuſtration hereof, in plate I. fig. 5.

A B, the picture, or plane, on which the perſpective repreſentations are to be drawn.

E, the place of the eye, which muſt be at a proper diſtance from the picture, as determined by the methods laid down in this work.

F G, the horizontal plane paſſes through the eye at E, and interſects the picture A B, at right angles, in the right line H L. [by Euc. 11, 5.]

H L, the right line, or ſection, where the picture and horizontal plane interſect each other, is called the horizontal line.

D I, the vertical plane, paſſes alſo through the eye at E, interſects the picture A B at right angles, in the line K M, and likewiſe cuts the horizontal line F G, perpendicularly in the line E Q.

K M, the right line, or ſection, where the picture and vertical plane interſect each other, is called the vertical line.

E C, the line which expreſſes the diſtance between the eye and the picture, is called the principal ray.

C, the point where the vertical and horizontal lines interſect each other, is the center of the picture.

This being premiſed, it is manifeſt that if the poſition of the picture, horizontal and vertical planes, with reſpect to each other be given, we ſhall then know how the two aſſumed, or laſt mentioned planes are ſituated, with reſpect to the picture. And becauſe the line E C, or diſtance between the eye and the picture is alſo ſuppoſed to be given, therefore if the diſtance between any object, and the ſaid three planes be known, it's repreſentation may be eaſily found. For inſtance, let us ſuppoſe the poſition of the eye, and the three afore-mentioned planes, to be the ſame as before deſcribed, and that the place on the picture, or perſpective repreſentation of any given point as S, were required, it may be readily found thus.

Draw the line Y S, perpendicular to the vertical plane D I.

Draw alſo S R perpendicular to the horizontal plane F G; then will Y S expreſs the diſtance of the given point S from the vertical plane, and S R it's diſtance from the horizontal plane.

Draw alſo Y E, S E, R E, Q E, and the figure E Y S R Q, will be a pyramid. Y S R Q is the plane of it's baſe, and is perpendicular to the vertical plane; *y s r* C, is a ſection

of

It would be very difficult, if not impoſſible, to aſſign one determinate diſtance, to be univerſally made uſe of; or ſuch a one as ſhould anſwer on all occaſions; becauſe the different circumſtances relating

B to

of the ſaid pyramid made by the picture, or plane of projection, conſequently is parallel to Y S R Q. Now ſeeing that the line Q C expreſſes the diſtance between the picture and baſe of the ſaid pyramid, it is therefore the diſtance between the picture and the given point S; and becauſe the two pyramids E Y S R Q, E *y s r* C are ſimilar, we therefore get the following proportions,

E Q : Y Q : : E C : *y* C,
or, which is the ſame,
E C + C Q : S R : : E C : *s r*,
And E Q : Y Q : : R Q : *r* C,
or E Q : Y Q : : S Y : *s y*.

From the above analogies, we obtain the two following general rules for calculating the diſtance of the perſpective repreſentation of any object in the picture, from the horizontal and vertical lines.

I. For the diſtance from the horizontal line.

RULE

As E C + C Q, or E Q, the ſum of the diſtances of the eye, and given object from the picture, is to E C the diſtance of the eye from the picture; ſo is S R the diſtance of the object from the horizontal plane, to *s r* the diſtance of it's repreſentation in the picture from the horizontal line.

II. For the diſtance from the vertical line.

As E C + C Q, or E Q, the ſum of the diſtances of the eye and the object from the picture, is to E C, the diſtance between the eye and the picture; ſo is S Y, the diſtance of the object from the vertical plane, to *s y* the diſtance of it's repreſentation on the picture from the vertical line.

Although the three planes here mentioned, have been conſidered only as being perpendicular to each other, yet it is not abſolutely requiſite that they ſhould be ſo poſited; for when other ſituations are neceſſary, the above rules will hold good.

But if the given object be ſituated between the eye and the picture, thus, ſuppoſe (*s*) were the object, and the plane Y S R Q to be the picture, then it is plain that the repreſentation of (*s*) would be in (S), and may be calculated by the above rules; only by putting the word difference in the firſt term of each proportion, inſtead of the word ſum.

EXAMPLE.

Suppose the breadth of a picture to be 6 feet; alſo let E C, the diſtance of the eye from the picture be 6 feet; C Q, the diſtance of the object from the picture 4 feet; S R or Y Q, the diſtance of the object from the horizontal plane 15 inches; and let it be required to find (*s r*) the diſtance of it's repreſentation in the picture from the horizontal line H L.

CALCULATION.

As 120, the ſum of the diſtances between the eye and the picture, and given object and picture, reduced to inches, is to 72 inches, the diſtance between the eye and picture, ſo is 15 inches, the given object's diſtance from the horizontal plane, to 9 inches, it's diſtance in the picture from the horizontal line H L.

$$120 : 72 : : 15 : \frac{72 \times 15}{120} = 9. \quad \text{Q. E. I.}$$

So likewiſe ſuppoſing (*s y*) the diſtance of the repreſentation in the picture from the vertical line K M was required, S Y the diſtance of the object from the vertical plane being 10 inches, and the reſt as before.

$$\text{Then } 120 : 72 : : 10 : \frac{72 \times 10}{120} = 6. \quad \text{Q. E. I.}$$

By the firſt of theſe operations it appears, that according to the data of this example, the line *s r* = 9 inches, and the line *s y* = 6 inches, wherefore the true poſition of the required repreſentation is hereby determined.

Let us now ſuppoſe the object to be between the eye and the picture; for inſtance, let (*s*) be the object; the plane Y S R Q the picture; the eye being at E as before: 'tis required to find the lines S R, S Y, eſteeming *s r* = 9 inches, and *s y* = 6, as found by the above data.

Hence the diſtance of the eye from the picture E Q = 120 inches; the diſtance of the object from the picture C Q = 48 inches; the diſtance of the object from the horizontal plane *s r* = 9 inches; the diſtance of the object from the vertical plane *s y* = 6 inches.

Therefore, E Q — C Q : E Q : : *s r* : S R;

$$\text{or } 72 : 120 : : 9 : \frac{120 \times 9}{72} = 15.$$

Again, E Q — C Q : E Q : : *s y* : S Y;

$$\text{or } 72 : 120 : : 6 : \frac{120 \times 6}{72} = 10.$$

Whence it appears that S R = 15 inches, and S Y = 10 inches, the ſame as they were before given.

PLATE I. Fig. 1.

Because (*a b*) is by conſtruction parallel to 13, therefore (Euc. 6. 2.) a P : 1 P : : *a b* : 13; wherefore if the poſition of the point (*a*) be known, the repreſentation *a b* will be eaſily determined; for whatever ratio *a* P hath to 1 P, the ſame ratio will the repreſentation (*a b*) bear to the given original line 13. Thus if (*a* P) be two thirds of (1 P) then will (*a b*) be two thirds of 13, &c, Or, if the point (*b*) be given, then becauſe P *b* : P 3 : : *a b* : 13, therefore if either of the extremes be given, the whole repreſentation is known as above.

PLATE I. Fig. 2.

Because the lines C L, *a* 2, are parallel, the angle C L 2 is equal to the angle a 2 L, (Euc. 1. 29)

Also the angle L C *a*, is equal to the angle C *a* 2. And the angle C *b* L, is equal to the angle *a b* 2 (Euc. 1. 15) therefore the triangles C *b* L, 2 *b a*, are equiangular, wherefore (Euc. 6. 4.) *b c* : C L : : *a b* : *a* 2, hence the point (*b*) being known the repreſentation (*a b*) of the original line *a* 2, is eaſily found.

PLATE I. Fig. A.

Because *e c* is parallel to *a b*, the triangles *b a f*, *e c f*, are ſimilar, therefore *e* C : C *f* : : *a b* : *a f*. Or thus, ſuppoſe (*e*) the diſtance of the eye from the picture to be 3 feet; (*b*) the diſtance of the object from the picture to be 1 foot, and alſo 1 foot from the horizontal plane; to find it's diſtance from the horizontal line,

$4 : 3 : : 1 : \frac{3}{4}$ therefore *a f* is 1-4th of *a* C.

FIG. B.

Because *a b*, and *e l* are parallel, the triangles *b a f*, *e l f*, are ſimilar; therefore *e l* : *l f* : : *a b* : *a f*.

FIG. D.

Let *b l* be the horizontal line; *c* the center of the picture; *c e* the diſtance of the eye from the picture; and let it be required to find *b* and *l*, the vaniſhing points of a ſquare building, and correſponding with Fig. 3.

Because by hypotheſis the given angle is a right angle, and the given ſides *e l*, *e b*, have the ſame degree of obliquity, it conſequently follows that the points *b* and *l*, will be equally diſtant from the center *c*; therefore *c e*, the diſtance between the eye and the picture being known, that of the vaniſhing points *b* and *l*, is alſo known.

FIG. E,

Let *b l*, be the horizontal line, *c* the center of the picture, *c e* the diſtance between the eye and the picture, as before, and let it be required to find the vaniſhing points *b* and *l*, they being at unequal diſtances from the center *c*, and correſponding to Fig. 4.

Suppoſe *b c* = 2½, *c e* = 5.

Then *b c* : *c e* : : *c e* : *c l*; that is, $2{,}5 : 5 : : 5 : \frac{25}{2{,}5} = 10 = cl.$

therefore whatever part *b c* is of *c e*, the ſame part is *c e* of *c l*. But the diſtance of thoſe vaniſhing points, &c. may likewiſe be found mechanically, as is expreſſed by the dotted lines of theſe figures.

The ſame way of reaſoning might be applied to the repreſentations of ſurfaces, ſolids, &c. but what has been ſaid may ſuffice, for it was not intended by this Remark, to treat profeſſedly on this ſubject, but only to ſhew briefly the ſource from whence the rules for calculating perſpective repreſentations are derived.

to pictures, will frequently render a rule of this kind abfolutely impracticable. This is a truth known to every artift, that has had much practice in the fcience of perfpective; and fuch I would afk, whether experience is not the moft certain, or at leaft, the moft ready and convenient guide in this cafe?

I can however take fuch a diftance for the examples in this work as will beft anfwer the purpofe; and fhall at prefent make ufe of one common diftance, as a general method, for the fake of order and perfpicuity; and when it may be neceffary to vary in this effential requifite, I fhall give my reafons for fo doing, and make fuch farther obfervations, as may arife from the cafe before me.

Plate I. Fig. 1. Suppofe that A B D F was the fpace or fize allow'd for a picture or drawing. Divide the height A D into three equal parts, and draw a line H L through the loweft divifion for the § horizontal line; divide the width of the picture into two equal parts, and call C the * center of the picture. Again, take the utmoft width I K of the picture, and from C fet this width to H and L; then call C H and C L the diftance of the eye on both fides of C: all which being reduced into a more regular order will ftand as follows, viz.

1. H L, the horizontal line.
2. C, the center of the picture.
3. C H or C L, the diftance of the eye.
4. H and L, the points of diftance.

Now this is all that is previoufly neceffary for an explanation of the following fchemes, which I call univerfal rules for drawing the true perfpective reprefentations of any buildings, whether they be regular or elegant pieces of architecture, or fuch only, as are of the moft plain and fimple conftruction.

RULE I.

Fig. 1. To determine the perfpective length of any given line a b, when it is drawn parallel to the horizontal line; and to divide it fo as to have it reprefent any number of equal or unequal parts.

1. Divide the bottom A B of the picture into any number of equal parts (fuppofe ten parts) and call this line a fcale for adjufting the proportions of fuch objects as are to be drawn upon the picture.

2. Give the point a, for one end of the line propofed, and from a, draw at pleafure the parallel a b.

3. From any point, as 1 on the fcale, draw a line through the end a, to cut the horizontal line in P.

4. Give the fpace between 1 and 3, for the real length of the propofed line on the fcale, and from 3 draw a line to P, cutting a b in b, then will a b reprefent a length equal to the fpace 1 3. In like manner, if we would divide a b fo as to have it reprefent any number of equal or unequal parts, we muft firft mark on the fcale the given proportions, and from thence draw a line to P, which will cut a b in the points propofed, as in the figure.

And fuppofe a b is a line given in perfpective, and we would find what real length it reprefents; then draw a line from any point in the horizontal line through the ends of a b, to the fcale; which will fhew the real length. Thus a b reprefents fix parts, which may either ftand for fo many feet, or for the like number of any other proportionable parts, and fuch as may be beft adapted to the nature of the defign.

RULE II.

Fig. 2. To cut off a part a b of the line a C, that vanifhes into the center of the picture, fo as to reprefent any given length; and to obtain any number of perfpective divifions upon it.

1. From C fet off the width I K of the picture to L, for the diftance of the eye.

2. From

§ The horizontal line is varioufly placed by different authors, but this feems a medium between them.

* The center of the picture fhould (if poffible) be always placed in, or near, the middle of the horizontal line; but a deviation in this particular, will be fometimes unavoidable.

2. From L to any point (ſuppoſe) 2 on the ſcale, draw L 2 cutting a C in b; and then will a b repreſent the length a 2.

In like manner, lines drawn from any diviſions on the ſcale to L, will cut a C ſo as to give the perſpective of ſuch diviſions.

RULE III.

Fig. 3. To cut off a part a b of the line a H, that vaniſhes into one of the points of diſtance H; and to divide it as above.

1. Divide the diſtance C H or C L into five equal parts, and make the dot at P h two parts and 1-14th from C.

2. From any diviſion, as 1 on the ſcale, draw to P h, cutting a H in b; then will a b repreſent the real length a 1.

And to divide a b ſo as to repreſent any particular part in perſpective; we muſt ſet off the real lengths of thoſe parts on the ſcale, and then draw to P h, which will cut a b in the propoſed points.

Again for the line a c, which vaniſhes into the point of diſtance L.

1. Make the dot at P l the ſame diſtance from C as P h is from C.

2. From P l draw to any point 2; and ſo will a c be the perſpective of a 2, &c.

N. B. The points for cutting off are marked with the letters P h, P l; becauſe P h is for the lines that vaniſh into H, and P l for thoſe that vaniſh into L.

It is preſumed, that theſe three rules only will be ſufficient for the reducing almoſt every regular piece of architecture into perſpective, and in a greater variety of ſituations than has hitherto been attempted.

The firſt rule is adapted to the ſides of ſuch buildings as directly front, or are even with the eye; the ſecond to thoſe which run directly from the eye; and the third to ſuch as are viewed angle-ways, and in ſuch a manner that both ſides have an equal degree of obliquity. ‡

But to make this work as univerſal as poſſible, I will add a fourth rule, which may occaſionally be wanted, and which being infinite in its application (I am ſpeaking of ſquare buildings only) will anſwer for every degree of obliquity that can be propoſed; however this needs not at preſent to be attended to, being of no uſe in this volume.

RULE IV.

Fig. 4. Having given a b for the bottom of one ſide of any ſquare building; to find the vaniſhing points of both ſides, and alſo the points P h and P l, for cutting off &c.

For the ſide a b.

1. From the center C, erect the perpendicular C E, and make it equal to the given diſtance C H or C L.

2. Continue a b to cut the horizontal line in R; then is R the vaniſhing point of the ſide a b.

3. From R draw to E, and transfer the diſtance R E, from R to P h; then is P h the point for cutting off any part of a R by means of the ſcale a 2.

For the ſide a c.

1. From E, draw E Q perpendicular to R E, cutting the horizontal line in Q; then is Q the vaniſhing point of the ſide a c, therefore draw a Q.

C 2. From

‡ Unleſs the reader perfectly underſtands, and can eaſily recollect, the preceding general rules, &c., he may poſſibly find ſome difficulty in comprehending their various applications; not only in the next ſection, but in all the examples we ſhall hereafter give as illuſtrations of this ſubject.

2. From Q transfer the distance Q E to P l; and then is P l the point for cutting off any part a c of a Q, from the scale a 3.

From hence it is obvious, that a b represents the length a 2, and a c the length a 3; and that either of these lines a b or a c may be divided in perspective, by means of the points P h, P l, and the scale at the bottom of the picture; and in the same manner as in the preceding examples: and had I began with the side a c instead of a b, the operation would have been the same.

But there is a material difficulty, which arises from placing the vanishing point Q so far out of the picture; and that is, the having an inaccessible point, or at least, one at too great a distance to be readily brought into practice: this inconvenience may indeed be somewhat removed, by analogical proportion (as is shewn in my former work †) but even here the remedy will be almost as bad as the disease; and therefore when this happens to be the case, the shortest method seems to be that of making a small model, truly drawn upon paper, and then to transfer the several parts of this model to the picture, by the common method of reticulation or net-work.

SECTION II.

To determine the perspective of squares, in various situations.

EXAMPLE, I. For squares that are placed in an even situation, with respect to the picture.

Plate II. Fig. 5. A square with one side at the bottom of the picture.

1. Give 6 B for one side, and cut off B i to represent B 6 (by rule 2.)
2. Draw the parallel ih, and cut it off (by rule 1) to represent B 6.

EXAMPLE, II. A square by giving it's center c, and diameter, a b.

Let the center be in the line 2 C, at the distance of 3 feet.

1. Make 2 C to represent 2.5 (by rule 2.)
2. Through c draw the parallel a b (by rule 1) and make it to represent 4 feet, viz. two feet, on each side of the center c.
3. From e and d, draw the parallels e f, d g.

EXAMPLE, III. For any number of squares, one behind the other.

1. Cut off i l to represent i h, and draw the parallel l k.
2. Cut off l n to represent l k, and draw the parallel n m, &c.

N. B. In this Example, the space between, represents the width of one square.

EXAMPLE, IV. Fig. 6. For squares at any distance from each other; let one be 6, and the other 4 feet space.

1. Cut off A a, to represent A 3, and draw a b.
2. Draw also 9 C, and then the parallel b i represents 6 feet (by rule 1.)
3. Cut off b c to represent b i; then draw one parallel from c, and another from d.

Again for the space of four feet between the squares.

1. Draw from 7 to C, and also the parallel h e; then is h e the perspective of 4 feet (by rule 1.)
2. Then draw the square as before.

EXAMPLE, V. An oblique square, whose sides vanish into the points of distance, and whose nearest corner is 1 foot, 6 inches and an half from the bottom of the picture.

† See Dr. Brook Taylor's Perspective made easy, &c.

Plate

PLATE III. Fig. 7. Let the fides be 3 feet, 5 Inches and an half long.

1. Find the point b (by rule 2) and from thence draw lines to H and L.

2. From b draw the parallel b c, and make it to reprefent a 1, viz. 3 feet, 5 inches and an half (by rule 1)

3. Cut off b d to reprefent b c. (by rule 3)

4. Draw the parallel d f, then from d to L, and from f to H.

EXAMPLE, VI. An oblique fquare; by giving its center a, and the parallel diagonal b d, which diagonal we will make to reprefent 6 feet.

FIG. 8. Let the center a be five feet from the bottom of the picture.

1. Cut off 6 a to reprefent 6 1, viz. 5 feet. (by rule 2)

2. Through a draw the parallel b d, and from 3 and 9 (viz. 3 feet on each fide of 6) draw to C, which gives b d to reprefent 6 feet, (by rule 1)

3. Draw alfo from H and L through b d, meeting in c; and from H and L through b d, meeting in e.

EXAMPLE, VII. For oblique fquares placed at different diftances from each other.

PLATE IV. Fig. 9. Let the point 4 be the corner of the firft fquare, and let the fides be drawn to reprefent 2 feet.

1. Draw from 4 to H and L; and then cut off 4 a to reprefent 4 2, and 4 b to reprefent 4 6, (by rule 3)

2. From b draw to H, and from a to L.

3. From 2 draw to H, and then the parallel a k, which will reprefent 2 feet, viz. the fpace 2 4, (by rule 1)

4. Cut off a m to reprefent a k, and draw the parallel m p, then cut off m n for the perfpective of m p, (by rule 3)

5. From m and n draw to L, and fo will the fpace a m, or c l reprefent the width of one fquare, viz. 2 feet; and l m n o is another fquare.

AGAIN, for any other fpace between the fquares, fuppofe 4 feet, viz. from 4 to 8.

1. Draw from 8 to L, and then from b the parallel b d.

2. From d to P l cuts off b e to reprefent b d, viz. 4 feet.

3. From 6 (the given width of the firft fquare) draw to L, then from e the parallel e i will reprefent 2 feet, (by rule 1) therefore draw from i to P l, which gives the fide e g.

4. From e and g draw to H; and continue a c to L.

EXAMPLE VIII. For circles.

EVERY point in the circumference of a circle being at an equal diftance from the center, therefore every line that can be drawn from the center to the circumference muft be equal: if therefore the center of a circle, and one parallel diameter be either given, or determined in perfpective, then the reprefentations of other diameters may be found by the rules already explained; and having obtained a fufficient number of points to reprefent fo many dots in the diameter of a circle, the appearance of it may be drawn with great facility and exactnefs.—Indeed in large circles (fuch as the plans of temples, &c.) many points will become neceffary; but fmaller circles, fuch as the plans of columns, and the like, eight points only will be found fufficient, and frequently not many more than half that number.

FIG. 10. For a circle, whofe center is 3 feet within the picture, and whofe diameter is to reprefent 4 feet. Let the center be fomewhere in the line 4 C.

1. Cut off the line 4 c, to reprefent the line 4 7, viz. 3 feet.

2. Draw from H through a, which will cut off c e to reprefent c a; and from H to b will cut off c f to reprefent c b (by rule 2.)

3. Draw from H and L through the center c.

4. From P h to a, will cut off c h, to reprefent c a; and from P h through b, will cut off c g to reprefent c b (by rule 3.)

5. In like manner, from P l through a, will cut off c i to reprefent c a; and from P l to b will cut off c k to reprefent c b.

6. Through the eight points thus obtained, draw a curved line, as in the figure.

By the fame means, the perfpective of all circles may be determined, viz. by giving their centers and diameters; as l m n, and o p q.——And by rule 1, their perfpective lengths may be adjufted: thus from any point S, on the horizontal line, draw lines from thence through o,q to the bottom, which will fhew the real fize of o q, and which in this cafe reprefents 4 feet.

Having fhewn how to apply thefe general rules, in finding the perfpective reprefentations of fquares and circles (figures of the moft fimple conftruction, but neverthelefs of fuch importance in architecture, is to conftitute the moft general forms of it; and therefore in a work of this nature, of great importance) we will now proceed to the confideration of a few bodies fimply conftructed, as preparatory to [illegible].

SECTION III.

For putting cubes and cylinders into Perfpective.

EXAMPLE, I. A parallel cube of 2 feet fquare, and placed at the bottom of the picture.

Plate V. Fig. 11. Draw the front fide a b 1 3; and lines from b,a,3 to C; then from 5 draw to H; and from c the perpendicular c d; from d draw another parallel as in the figure, (by rule 1. 2.)

EXAMPLE, II. The fame figure placed at one foot diftance within the picture.

From 6 to L gives the corner f, (by rule 2.) Draw from 5 to C, and the parallel f e; then make f g equal to f e, and draw the front fide f i k g, from e to L gives the point h; from h draw the perpendicular k l, and from l another parallel.

EXAMPLE, III. Several cubes one behind another.

Fig. 12. Draw the front fide A a b 2; from a, b, 2, draw lines to C, then compleat the firft cube as above. Again, draw from 4 to C, and alfo the parallel c d; then from d draw a line to H, which gives a fpace to reprefent the width of one cube; from g draw the parallel g h, and a line from h to H will give the width of another cube; therefore, from g and n draw perpendiculars cutting b C, and from thefe interfections draw the parallels for the top. (by rule 1. 2.)

Having drawn the cubes on one fide, thofe on the other are to be obtained with great facility, and equal exactnefs, in the following manner.

EXAMPLE, IV. For obtaining the fame number of cubes on the oppofite fide, from thefe already drawn.

Fig. 12. Upon 8 B draw the front fide; from 8 and the two upper corners, draw lines to C; and from the feveral corners of the cubes already drawn, produce parallels, as c m, cutting 8 C; from thofe interfections draw perpendiculars for the fides, and then the parallels for the tops, &c.

N. B.

N. B. The tops and bottoms of cubes, are ſimilar figures, placed directly over, and parallel to each other; and therefore the ſame rule which determines the perſpective appearances of the bottoms, muſt determine thoſe of the tops alſo. And this will hold univerſally true, not only in cubes, but in cylinders, and in any other figures that are conſtructed in this manner.

EXAMPLE, V. For an oblique cube 2 feet ſquare; and the neareſt corner to be 1 foot from the bottom of the picture.

PLATE VI. Fig. 13. Find, by the ſecond rule, the corner a; by the firſt, the length a b; by the third, the depth a c; draw the parallel c d, which gives the other ſide a d. From c, a, d, draw the perpendiculars c f, a e, d g; and a e equal to a b; then from e draw lines to H and L; and from f and g draw lines to H and L.

EXAMPLE, VI. For ſeveral oblique cubes; like the laſt figure, one behind the other; both to the right and left.

FIG. 14. Draw the firſt cube from the point 5; draw lines from 5 to H and L; and from 7 to P l gives the ſide 5 b; draw the parallel b c; then the perpendiculars for the upright edges; and make 5 a equal to 5 7, and draw the lines from a to H and L, and alſo from d to L; laſtly, draw from e to H, which finiſhes one cube.

LET the ſpaces between the cubes be 3 feet. Draw a line from 8 to L; and another from b; and then the parallel b f, which is 3 feet (by rule 1) then from f to P l gives b g to repreſent b f. (by rule 3) From 7 draw a line to L; and from g the parallel g h, which repreſents 2 feet (by rule 1) that is, the width of one cube; then from h draw a line to P l, which gives the ſide g i; therefore draw a line from g to H, and from c to L, which will produce the other ſide g m. Again, from g, m, i draw perpendiculars as in the figure, and then interſections with the lines, drawn from the top of the firſt cube to L, will determine the height of two ſides; and by drawing other lines to H, as n H we ſhall compleat another cube; and ſo on.

THE figures on the right hand ſide, are found from thoſe which are already drawn by means of parallel lines, viz, in the ſame manner, as thoſe in example 4.

EXAMPLE VII. For putting cylinders into perſpective.

FIG. 15. Let the propoſed cylinder be 4 feet in diameter, 6 feet high, 3 feet from the bottom of the picture, and let the center be in the line 3 C.

FIND the point c, by rule 2, and the diameter a b, by rule 1; with the diameter a b find the perſpective of a circle, as in Fig. 10; divide a b into 4 feet, by rule 1. From c draw the perpendicular c m, then take 1 foot from a b, and from c ſet it ſix times to m; through m draw the parallel k l, and make it equal to the lower diameter a b; with k l find the perſpective of another circle, then from the outer parts of each oval draw lines, as a l, b l, which will compleat the propoſed repreſentation.

FIG. 16. For two cylinders one behind the other.

LET the center c and m of the cylinders be in the line 9 C; and let each be 2 feet in diameter, and 5 feet high. Let the center of the firſt cylinder be only 1 foot from the bottom of the picture, but that of the other 6 feet.

BY rule 1 and 2 we may obtain the center c and the diameter a b of the firſt cylinder; and the whole operation is the ſame as in the laſt figure. By the ſame rules we find alſo the center m, and diameter l n of the fartheſt cylinder; and by drawing a line from f to c we ſhall have the height of it.

SECTION IV.

PLATE VIII. Introduction to the perſpective of ſquare and circular mouldings, &c.

THE variety of mouldings which compoſe an Order of Architecture, are reducible to ſeven, viz. the Plinth, the Torus, the Scotia, the Cincture, the Cavetto, the Ovolo, and the Cyma.

‡ THE regular mouldings of an Order, may be conceived to be made up of many ſquare and circular horizontal planes, like thin paſteboards of different widths, cut out, and laid in ſuch a manner upon one another, as to give the peculiar form, or ſhape of each moulding; and therefore in order to produce them in Perſpective, nothing more ſeems neceſſary, than general rules for finding the repreſentation of a ſquare and a circle from given diameters. And to illuſtrate this by familiar examples; let us firſt obſerve, that the cube and ſphere (or as it is commonly called the globe) are figures of a more ſimple conſtruction than any of the other geometrical bodies; now if theſe can be reduced into perſpective, by two general, or univerſal rules only, it will greatly facilitate each ſucceeding operation.

IT is well known, that the cube is a body, contained under ſix geometrical ſquares, placed at right angles with each other. Now if we imagine all but the upper and under ſquares to be taken away, as in Fig. D, and the upper one to be ſupported by props at the four corners; we ſhall then have as perfect an idea of a cube, as we had before with it's whole contents; therefore if we conceive a cube to be a figure contained under two ſquare planes of the ſame dimenſions, and placed exactly even, and at a determinate height from each other, then nothing more is required for compleating the repreſentation of it, than to find the perſpective appearance of thoſe two planes only. And the general rule for finding a ſquare (as in Fig. 5) will be ſufficient for this purpoſe; for the different ſituations of the ſquares, require only a repetition of the ſame rule, viz. that for cutting off a line which vaniſhes into the center of the picture, ſo as to repreſent a given length. See plate II.

IN like manner, we may imagine, (as was obſerved above) how any mouldings which are placed about ſquare bodies, may be compoſed of many ſquare planes, like thin paſteboards of different breadths, &c. which is obvious by the figures of plate IX.

PLATE VIII. And ſuppoſe alſo that a globe was cut directly through it's center, in a perpendicular direction, then the ſection to each half, will be a circle; ſo that if Fig. A be made to repreſent that ſection, then it may be conſidered as the elevation of a globe of a given diameter.

AGAIN, imagine the globe to be cut in the ſame manner, through it's center, but in an horizontal direction; then this ſection alſo will be a circle; which is repreſented by Fig. B, whoſe parallel diameter is i k: and whatever ſections are made parallel to this horizontal one, they will all be circles; whoſe diameters will be perpetually leſs and leſs, as they are farther and farther removed from c, the center of the globe; as is evident by the parallel lines within Fig. A.

FIG. A. Now let the upper line H L be the horizontal line, with the ſeveral neceſſary points put upon it, for determining the perſpective of a circle; and let this circle be the given elevation of a globe, whoſe utmoſt height is a b.

DRAW a b perpendicular to the horizontal line, and ſo as to touch the bottom of the circle at a; and from any point draw d in Fig. B, draw another perpendicular at pleaſure; then continue h g in Fig. A, through the perpendicular d c of Fig. b, and make i k of Fig. B alike, and equal to g h in Fig. A: with i k find the repreſentation of a circle. Again, take any other diameter from Fig. A, and proceed in the ſame manner with Fig. B, and ſo ſhall we obtain the perſpectives of as many circles from given diameters, (ſee Fig. E) as will be neceſſary; and by then drawing one continued curved line ſo exactly as to touch thoſe

‡ As for the Ionic, Corinthian, and Compoſite capitals, the Doric triglyphs, dentals, modilions, and the like; theſe having various conſtructions, and being of no conſequence in this place, are therefore omitted for the preſent; but they ſhall be fully conſidered hereafter.

thoſe extremities we ſhall have the projection of a globe on the perſpective plane or picture, which is compleated in Fig. F.

From hence then, it is eaſy to conceive, that if the ſeveral parallel lines within Fig. A are taken for the diameters of ſo many circular planes, which ſeverally extend themſelves exactly to the circumference of the globe, and are all fixed in their centers upon the line a b, as a common axis, like e f Fig. E; then this figure put into perſpective will give the ſhape of the projected globe to great exactneſs; and the nearer theſe planes are placed to each other, ſo much the more exactly will the ſhape be determined. This ſufficiently ſhews us in what manner a globe or ſphere may be made of circular horizontal planes of different diameters, and from thence, how to draw its projection upon the picture.

Now, if the projected repreſentation of the ſimple and uniform figure of a globe, can be thus determined, by a variety of imaginary circular planes placed in an horizontal direction, and perpetually varied in their diameters; then by the ſame rule, the perſpective of cylindrical, and conical figures may be obtained alſo. And all forms whatſoever, which are bounded by circular outlines, or which may be conceived to be conſtructed of horizontal circular planes, may be put into perſpective by that one invariable rule, which we have given for finding the perſpective repreſentation of a circle only. And this one method will do for all kinds of circular mouldings. *

SECTION V.

Two general rules for the perſpective of ſquare and circular Mouldings.

RULE, I.

For Square Mouldings.

The method, which architects make uſe of, for drawing the elevation of an order, or for any part of it; is the ſame as we ſhall follow in putting mouldings, or a whole order into perſpective: for by this means we ſhall have the given heights and widths of each object, put at once in their proper places, and from thence the perſpective of the whole may be determined, with great facility and exactneſs.

Plate IX. Suppoſe then, that H L is the horizontal line, C the center of the picture; H and L the points of diſtance, A the elevation of a plinth below the horizontal line, and B the elevation of a ſquare cyma. Above the horizontal line, draw within the cyma B any number of parallel lines, ſo as touch the extremities of the moulding. Then from any point D, draw the perpendicular D E; and from A, B transfer the ſeveral parallel lengths of the mouldings, and mark the end of each line ſo as to make it very exact and diſtinct. Now it is evident, that the two lines at D will give a perfect idea, and be the true dimenſions of the plinth; and that the lines at B do as truly meaſure and characterize the cyma.

EXAMPLE I.

First for the Plinth.

Let us now imagine that Fig. A is an upright parallel ſection (like 1 2 4 5, Fig. G) made exactly through the middle of the plinth: and that Fig. B is a ſection made in like manner through the cyma, with the ſeveral parallel lines drawn acroſs it, as in the figure.

From any point G, of the line A G, draw the perpendicular G F at pleaſure; transfer the ſeveral parallel lines from A and B to G and F; as was done before to D and E. From C draw lines through 1 2, at pleaſure; and from L draw a line through 3, cutting the lines 2 C and 6 C in 6 and 7; then draw the paral els 6 9 and 7 8, which finiſhes the top. From 8, 6, 9 let fall perpendiculars at pleaſure; and draw a line from C through the point 4, which will give the oblique end; and a line from the point a, parallel to 6 9, will compleat the repreſentation required.

F I

* Here I am aware of laying myſelf a little open to thoſe who perſiſt in keeping up to the ſtricteſt mathematical principles of perſpective, in drawing the repreſentations of all objects whatſoever. But if thoſe gentlemen will ſuſpend their criticiſms for the preſent, I may poſſibly place this matter in its proper light; or at leaſt give ſuch hints, as may be thought of ſome importance.

I have here repeated the operation for determining the perſpective of a ſquare; that is, the top of the plinth, for the ſake of a regular proceſs; but the reader will at once perceive, that it is no more than a ſquare, found by it's center and diameter; as was ſhewn before by the ſecond example in Fig. 5, and with which, it is ſuppoſed, he is very well acquainted; and therefore henceforward, I ſhall only ſay, find a ſquare by it's center and diameter.

This figure is ſufficient for ſhewing, how any ſquare moulding with even ſides, may be put into perſpective; and the operation will be the very ſame, for finding the repreſentation of any ſquare moulding, whoſe ſides are uneven, or which are conſtructed of different degrees of curvature; ſuch as the Ovolo, Cyma, &c. only the rule will be oftener repeated, as will be ſeen by the next example.

EXAMPLE, II.

For the Cyma.

The ſeveral widths for ſhaping the moulding having been transferred as before directed; find the under ſquare, by it's center and diameter; which gives the bottom of the moulding, as ſeen above the horizontal line; then by the ſame method, find (in a regular ſucceſſion) the perſpective of as many other ſquares, as there are given diameters, which will determine the exact ſhape of all the corners of the moulding; ſo that by drawing curved lines through thoſe points, the repreſentation of the whole moulding will be obtained; even to the moſt ſcrupulous exactneſs.

But ſince the finding ſo many ſquares together, will occaſion ſome confuſion, therefore this may be avoided, by drawing the under one firſt; then only ſo much of the others, as are neceſſary for obtaining the three viſible points of each ſquare; marking thoſe points with ink (as in the figure) and rubbing out the pencil marks as we go on. But a little practice will make all this very familiar, and particularly to thoſe, who are tolerably ſkill'd in drawing, for they will find that a very few ſquares will be ſufficient, and eſpecially for ſuch ſized columns, as are generally produced in drawings upon paper.

RULE II. EXAMPLE, I.

For Circular Mouldings.

Plate X. Let A be a perpendicular ſection, made through the axis, or middle of a circular plinth or cincture; and B ſuch another ſection made through the ovolo.

Now ſince the plinth is even all round, we therefore need only find the upper circle, and part of the under one; but ſince the ſide of the ovolo is a curved line, therefore three diameters, at leaſt, will be neceſſary for obtaining the perſpective of this moulding, ſo as to make it correct; all which lines are transferred to D E, that the ſimilar lines on f G. may be diſtinguiſhed without confuſion.

For the Plinth or Cincture.

With the given diameter 1 2, and the ‡ points P h, P l, for cutting off, find the perſpective of the upper circle, as directed by Fig. 10; which we ſhall repeat in this place. The line 1 2 is the given diameter; and F is the center of the circle: from H, C, L, draw lines through the center F at pleaſure. From H or L, through 1 and 2, will give the points a and b on the line drawn from C through F: from P h, through 1 and 2, will give the points e and f, in the line drawn from H through F; and from P l, through 1 and 2, will give the points c and d, in the line drawn from L through F, &c. in the ſame manner, find as many points as are neceſſary for drawing the appearance of the under circle, from it's given diameter 3 5; and then a perpendicular on each ſide, ſo as to touch the extremities of the two circles, will compleat the repreſentation: which is the ſame as in the example in Fig. 10, beginning with

‡ See Plate I, Fig. 3. or Rule 3, Page 5.

with the fecond article. Or the points, for the under circles, may, in this cafe be found by letting fall perpendiculars from the points 1, d,a,f, in the upper circle, and then drawing lines from H, C, L, through the center f, to cut them; thus from L through f, gives the point 4, &c.

E X A M P L E, II.

For the Ovolo.

From the given diameter 8 6, find the perfpective of a circle above the horizontal line; do the fame from the other two diameters; then draw a curved line on each fide to touch the extremities of the three circles, which will give the true fhape of the ovolo in this fituation.

Now it muft be obvious from thefe four examples of the Plinth, the Cyma, the Cincture, and the Ovolo, how any other fquare, or circular mouldings, may be produced in perfpective, by the very fame rules; and by reconfidering each operation, we fhall find that, after having given the propofed place and dimenfions of each moulding, its whole appearance is to be univerfally determined by one general principle, viz. that for cutting off part of a line, fo as reprefent any given length.

For circular mouldings, we muft have at leaft three different lines drawn through the center of each circle to the horizontal line, and therefore there muft be three points for cutting off, which together comprehend the fecond and third general rules: but as for fquare mouldings, where one line only is neceffary for cutting off, &c. there one point only is required; which may be either the point H or L, (for both will anfwer the fame purpofe) and this is done by the fecond rule. In fhort, to fet down the regular procefs, it will ftand as follows.

1. Give the horizontal line, and the center of the picture.

2. Give a proper diftance for the propofed figures; that is, place the points H and L far enough from C.

3. Give the center of the moulding, and from thence draw the perpendicular for its axis.

4. Give the feveral lengths of the variable diameters, &c.

5. Find the points for cutting off, by rule 2 and 3.

6. And by the fame rules, find as many points in the reprefentation of the circumference as are required.

7. Draw regular out-lines, by means of thefe acquired points; and fo may each figure be compleated.

Plate XI. In thefe figures I had an eye to the bafket and tile, which is faid to have given the original hint for compofing the Corinthian capital: but it is here produced only as an example of a fquare and circular figure, joined together; which will ferve as a farther illuftration of the two general rules. For figure A is the fection through the middle of the object, with the parallel diameters for fhaping it. In figure B the tile only is finifhed in perfpective, and the fection of the bafket is placed under it. In figure D the reprefentation of the bafket only is drawn, by means of the perfpective of the circles. And in figure E the object is wholly compleated.

By the fame method we may obtain the perfpective reprefentations of ballufters, &c.

Plate XII. In this plate the figures are intended only by way of a preparatory hint for drawing the Tufcan column. For Fig. A is a fection of the whole order, with the parallel lines drawn acrofs its axis A B. On the line D E are the feveral diameters transferred: and Fig. F is the column compleated. †

† This diftance of the eye, in thefe and the two preceeding plates, being much too little, therefore the apparent depths of all the figures do appear a little prepofterous: but this was an inconvenience not to be avoided in this place, being obliged to bring the diftance within the compafs of the plates, for the fake of that clearnefs and precifion fo neceffary on this occafion.

B O O K II.

C H A P. I.

An Application of the foregoing Rules, to the feveral Orders of Architecture.

The T U S C A N O R D E R.

S E C T I O N I.

THE methods by which any fingle mouldings, that are either directly fquare, or exactly circular, may be put into perfpective; have been fo fully explained in the laft fection of book I, and are fo eafily underftood, and retained in the memory; and withal are fo univerfally applicable in almoft every part of the five Orders, that thofe rules perfectly comprehended, will make the examples in this chapter fo very plain and obvious, at firft fight, as to appear in a great degree felf-evident; and will moreover fhew the advantages which may be obtained, from building the general practice of this fcience, upon the moft obvious and fimple principles.

However, it is abfolutely neceffary for the learner not only to underftand, and perfectly remember the general rules; but alfo to apply them to practice, in delineating two, three, or more mouldings of each kind together, before he attempts to begin with drawing the reprefentation of the whole Order: for I now fuppofe that he is perfectly acquainted with thofe fundamental principles, in order to avoid a repetition of the fame thing for every moulding, and to prevent that confufion which would neceffarily be confequent upon it.

Now, though there be no occafion for drawing the elevation of the object intended to be put into perfpective, but to take the feveral heights and projections from the Architectonic Sector, as they are wanted in each operation; yet, fince the explication of any new fyftem fhould be affifted by every poffible means, which may render it eafy and familiar; therefore I have given many of the elevations to the examples in this chapter: for by this means the reader will fee the correfpondency between the parts in the perfpectives and their elevations, and from thence will the more readily comprehend my meaning. But thofe who fhall not choofe to draw out an elevation for every object, may fhorten the work by drawing fo much only, as is expreffed on the left hand of Fig. A B.

Plate XIII. And that all the examples may have the moft agreeable fhapes that the plates in this work will admit of, and that the learner may know the exact place of the vanifhing points to every figure; I fhall in general make the diftance of the eye equal to the utmoft width H L of each plate, as was obferved before in page 1; which length H L being fet from C to the right and left on the horizontal line, will give the points H, L. And as for the other two points, viz. P h and P l for circles, they have been fully explained before.

For the Pedeftal and Bafe.

Let D be the bottom of the plinth, and D E the axis of the column.

1. Draw

1. Draw A D parallel to the horizontal line, and continue it at pleaſure: then from any point A draw the perpendicular A B; and thereon the elevation to any propoſed bigneſs.

2. Upon the axis DE transfer the heights and projections of the ſeveral mouldings from the elevation A B; in a regular ſucceſſion as they are wanted.

3. Begin with the plinth, and by rule 1, example 1, for ſquare mouldings find it's perſpective; then draw the lines which are to be viſible with ink, and then rub out the pencil marks.

4. By the ſame rule, and in the ſame manner, draw the fillet.

5. The Doric cyma reverſa is drawn by rule 1, example 2.

6. The dye by the ſame rule as the plinth, viz. rule 1, example 1.

7. The Doric cyma by rule 2, example 2.

8. The other fillet by rule 1, example 1.

9. The plinth of the baſe by rule 1, example 1; or it's projection by the dye already determined.

10. The torus by rule 2, example 2.

11. The cincture by rule 2, example 1.

12. And the bottom of the ſhaft of the column by rule 2, example 1.

THIS figure ſhews how the pedeſtal and baſe will appear, when they are lower than the eye, and on one ſide of it; and in the 14th plate, the ſame figure is wholly finiſhed, with another of the ſame ſize placed directly under the eye: and the method for finding this, from that already drawn, comes next under conſideration.

PLATE XIV. 1. From the center C draw the perpendicular A C, and from B the parallel A B.

2. Continue (by parallels) the ſeveral lines which form the front mouldings of Fig. B acroſs the line A C.

3. Take half the widths of each moulding from B, ſet them on each ſide of A C, and compleat the front mouldings.

4. From the end of each moulding draw a line towards C; and then parallels from the fartheſt projections, as a b, will give all the apparent depths.

5. For the baſe of the column, it will be neceſſary (in order to draw it very correct) to repeat the operation as in the former figure.

For the Tuſcan capital and entablature, and to make it correſpond with the pedeſtal already drawn.

PLATE XV. Here E G is the axis of the column continued, F is a given point near the top of it's ſhaft, and A B the elevation, taken by the ſame ſcale as the former, from the Sector.

1. From the elevation, transfer the ſeveral lines as before directed to F G, for the heights and widths of the mouldings.

2. By rule 2, example 1, draw the appearance of the ſhaft, the neck and cinctures in their ſucceſſive progreſſions.

3. By rule 2, example 2, determine the aſtragal and ovolo.

4. By rule 1, example 1, The abacus, the architrave, the frieze, fillets and corona.

5. By rule 1, example 2, find the perſpective of the cavetto, the ovolo and cyma, as they follow in their ſeveral Orders; and from hence compleat the outline.

PLATE XVI. Here we have this and another figure, as finiſhed prints to correſpond with thoſe in plate 14.

And now let me obferve again, that (not only in drawing this, but alfo all the other orders) the learner is defired to be perfectly mafter of one thing, before he attempts the leaft part of that which follows: for the whole of this fyftem, though built upon two of the moft fimple rules, yet the tranfpofing and varying thofe rules, will require fome degree of attention, and above all a regular way of inveftigation. He therefore who fhall attempt to learn this part of perfpective, without regularly proceeding with the feveral fchemes, will be as unlikely to fucceed in it, as he would in learning any other fcience with an equal degree of inattention.

The DORIC ORDER.

SECTION II.

IT would be ufelefs were we to repeat the operation for the feveral mouldings of this, or the other three orders, becaufe it will be exactly the fame in all cafes; and as I fuppofe the learner to be perfectly acquainted with the perfpective of mouldings, whether feparated or combined, therefore I fhall now lead him to thofe parts of an order only that are not direct fquares, or perfect circles; fuch as the Trigliphs, Soffits, the Capitals, Modillions, Dentals, &c. in the following examples: becaufe in thefe few inftances the general rules muft be a little varied in their applications; that is, the fame rule muft be oftener repeated in the fame place.

EXAMPLE I.

Plate XVII. For the Band of the Trigliph Capital, and for the Plinth of the Trigliph, &c.

1. Take the feveral heights and projections from the elevation, Fig. X. as they are expreffed on the line 1-5, and transfer them to Fig. G and D.

2. Fig. G, D. By rule 1 find the perfpective of four fquares, from the feveral diameters 2 2, 3 3, 4 4, 5 5.

3. Make a dot at every angle, or joining of the foffit, and from every vifible corner draw a perpendicular upwards, as in Fig. E.

4. Transfer the height 1 7, Fig. X. to 1 7 (or to 5 6) Fig. E. and draw from C through 6 to 8, and then from the point 8 draw the parrallel 8 9, &c.

Now let the reader carefully obferve the difference between the method ufed for this, and that for producing fquare mouldings; and almoft one glance of the eye will fhew him, that in Fig. D. four fquares of different diameters are put into perfpective upon the fame plane; and that this is performed by the very fame rule as has all along been ufed for fquare mouldings, with this difference only, viz. here it is four times repeated upon the fame line 5 5. And any architect will immediately trace out the feveral angles or corners of the moulding, by confidering the perfpective D as a plan or fection of the entablature in this place, viz. that part of it which feparates the frieze and cornice.

Fig. Z. Since the feveral widths of the plinths of the trigliphs exactly correfpond with thofe of the band and capital already determined, this part of the drawing may be cut very fhort, thus. Draw in its proper place the line e b, for the under part of the Tenia, and fet off the feveral breadths or projections, viz. a, b, c, d, e, from Fig. X; then lines drawn from C, through the points on e b, and alfo perpendiculars from the corners of the band, already drawn as m n, will give all the widths, as in the figure.

EXAMPLE

EXAMPLE, II.

For the Trigliphs.

Plate XVIII. This example having more work in it than the former, I have for that reafon made two feparate figures of the fame thing, as Fig. F and G; and we fuppofe that every part of thofe figures are already drawn, except the trigliphs and drops, which come in the laft place as ornaments for decorating and compleating the whole.

N. B. The center of the picture for Fig. F, is found by fetting the fpace A C from B to the right hand, on the horizontal line; and K is the point of diftance that belongs to this fecond center.

In the firft place let us imagine, that the channels of the trigliphs, and the fpaces between them, are wholly taken off, or cut fmoothly away, like Fig. I; for then the operation will differ but very little from the laft example.

1. The projections, &c. being transferred from the correfponding points on Fig. D, then through the feveral points 4,4, 8, 6, Fig. F, draw lines from the other center of the picture; and from the vanifhing point K of the diagonal, draw through the axis 2, cutting the aforefaid lines, as in the figure.

2. From thefe points, fo obtained on the diagonal 7 8, draw parallels, which will determine a back or flat part for the trigliphs, like Fig. I, and alfo the top of the channels.

3. Set the height above the channels from 2 to 3, and the top of the infide of the channels from 2 to 1; and from thence determine their heights on the middle of the fide trigliph, as 7 8, &c.

4. For the channels, Fig. G. Divide the breadth of the top of the channels and the parallel for the bottom of them, each into 12 equal parts, and from thence compleat the channels of the front trigliph, as expreffed by the lines at the bottom of it.

5. From C fet the diftance H L of the eye, to the right on the horizontal line, and from the point fo obtained, draw to the feveral divifions on the front trigliph, which cutting the correfponding lines on the fide trigliph, will determine the perfpective breadth of the channels in that place.

N. B. The reader is defired to remember this rule, for finding the channels on the fide trigliph, fince it will be very ufeful, and will be more fully explained hereafter.

EXAMPLE III.

For the Drops and their Corona.

1. The Corona is found exactly in the fame manner as was the capital of the trigliph, Fig. B, viz. by fetting the feveral widths in their proper places; then giving their heights, and then drawing from the center of the picture C, and from the point of diftance K, Fig. F.

2. The drops. From Fig. D transfer the widths on the line a b to their proper places on the line b d, Fig. F.

3. Draw as before from the center C, and from K; which will give the points marked on the diagonal g h.

4. Through the points on the diagonal g h, draw parallels, which will produce little fquares in perfpective, as in the figure, for the under parts of each drop.

5. Divide the front corona into twelve parts, which will give the place for the top of each drop, and the fide drops are obtained, like the fide channels.

EXAMPLE IV.

For the foffit to the corona of the cornice.

1. Take from a b, under the corona of Fig. D, and fet thefe feveral divifions for the ornaments, on b b, Fig. E, as before; and through thefe divifions draw lines from C at pleafure.

2. Produce

2. Produce the diagonal d e, cutting the lines drawn from C, and mark very diſtinctly, all the interſections on it.

3. From the points on the diagonal d e draw parallels, which will give all the parallel ſquares, and alſo the middle points for thoſe which are viewed in an oblique manner.

4. Within all the ſmalleſt ſquares, draw the appearance of ſo many circles for the under parts of the drops, and the larger ſquares are ſufficient for compleating the ornaments in and about them.

N. B. The ſides of the oblique ſquares muſt be drawn to the points of diſtance.

5. The heights for the drops, &c. are to be found by ſetting thoſe heights from b b upwards; as b f, &c.

PLATE XIX. This plate contains a compleat outline of the whole Order.

PLATE XX. Here we have the Order wholly compleated.

PLATE XXI. This exhibits a Doric entablature (drawn to the ſame ſize, as thoſe in plate XVII, and XVIII) which is wholly compleated.

N. B. In this as in all the other finiſhed examples; I have begun with the loweſt part, and ſo worked upwards; though it would be equally the ſame thing, were we to begin at the top and work downwards.

The ANCIENT IONIC ORDER.

SECTION III.

PLATE XXII. In this plate I have only to ſhew how to produce the volutes of the capital, when they are viewed either ſide-ways or in front; and to give a rule for determining the dentals, and ſome other ornaments.

EXAMPLE, I.

For the volute in front.

FIG. D contains the heights and projections of the abacus, the ovolo and aſtragal; and alſo the utmoſt projection a b of the volute, it's height g f, and the centers d,e&c. for deſcribing it. §

FIG. E. Firſt draw the abacus by the method for ſquare mouldings, and then find the centers for the horns of the volute.

1. From Fig. D, transfer the point c, to the correſponding point c on Fig. E; which is the height for the center of the eye of the volute, that is, the middle of the aſtragal,; then through this point c draw the parallel e e, and make c e, c e of this figure, reſpectively equal to c e, of figure D.

2. From C draw lines through e and e; and from the point of diſtance draw the line 1 3 through the points, and then the parallels 1 2 and 3 4 will give the perſpective of a ſquare, whoſe corners 1, 2, 3, 4 will be the centers for the eyes of the four volutes; and the little ſquares at thoſe corners will be for placing the centers, &c. which may be more clearly ſeen by Fig. G, where this part of the figure is enlarged.

3. By the line g o (which determines the bottom of the volute) we obtain the perſpective of another ſquare, whoſe corners will determine the bottom or loweſt part of the volutes.

4. Through

§ The front of the volutes may either be deſcribed from centers, which is the common method uſed by architects; or they may be drawn by hand with the aſſiſtance of the Architectonic Sector.

4. Through the center for the eye of each volute (Fig. F) draw a parallel line for the breadths, and then defcribe all the volutes that are vifible by the common method of twelve centers.

5. Give the projection of the ovolo (Fig. F) which will be a guide for the middle of the fide of the volute, and confequently for finifhing that part of it: though in this particular a good deal muft depend upon a nicenefs in drawing.

6. And laftly, find the perfpective of the circular mouldings, viz. the ovolo, the aftragal, and cincture, by the former rules; and then draw in with ink fo much of each, as appears between the volutes.

E X A M P L E II.

For the Volutes, when they are viewed fideways, like Fig. I.

Fig. K is the elevation of half the capital in front; and Fig. L is the elevation of half the fide of it.

1. In Fig. H determine the appearance of the abacus, and from the middle of the oblique fide at e, draw the perpendicular e d at pleafure.

2. Through the axis of the column at k, (which is the height for the center of the eye of the volute) draw a parallel line a c at pleafure, cutting e d in b.

3. From b as a center, fet off the feveral divifions to the right and left, as they are mark'd with dots on a c (Fig. K) and do the fame by the line e d.

4. From C 2 (on the loweft horizontal line) draw through the center b at pleafure; and at the point of diftance (to the right hand) put a pin, and lay a ruler to it; then by moving it to the dots on the line a c, and fucceffively croffing g f we fhall obtain correfponding dots on the line f g; which dots will determine the breadths for the revolutions of the volute, and confequently the two centers for the eyes of them; therefore through thofe centers draw perpendiculars as in the figure.

5. From C 2, draw through the dots on the perpendicular d e; which will give correfponding dots on the perpendiculars that pafs through the centers of the eyes of the volutes.

6. Having obtained the above dots on the perpendicular and tranfverfe lines, we may from thofe finifh the two reticulated planes, which will be the perfpectives of the reticulated elevation above, in Fig. K, and confequently from the reticulations, fo obtained in perfpective, we fhall be enabled to draw one face of the capital to great exactnefs.

7. And laftly, having drawn the reticulated plane for the neareft volute, that on the right hand corner is produced from it, by means of parallel lines, &c.

N. B. g i is the breadth of the band of the volute.

In Fig. I the fcrolls of the volutes are compleated. We will now determine the middle of the fide: and to do this we need only draw the circular mouldings, then find the middle of the ovolo and aftragal, with the middle f of the under part of the abacus; for this will direct us in drawing the curved line f, e, d, and will be a fufficient guide for compleating the capital: a finifhed example of which we have exhibited in the next plate, 2 5, viz. Fig. I.

E X A M P L E III.

For Dentals.

Fig. A contains the heights and projections of the whole cornice; a b is the height of the dentals; and c d contains their feveral widths, &c.

1. At Fig. B place the height a b of the dentals, and through b draw a parallel line, and then from Fig. A transfer the feveral widths to c d.

2. Now draw a line from C through the ends c and d, and another from the point of diſtance through the center b; which gives a ſquare, &c. as in the Doric ſoffit, Plate XVIII, Fig. E.

3. From C draw through the other diviſions on c b, ſo as to cut the diagonal, and to give the widths of the dentals in front.

4. Through the diviſions on the diagonal draw parallels, which will give the ſide dentals, &c.

N. B. In Fig. C, the dentals are drawn larger, and denticles are put between them.

EXAMPLE, IV.

For the ornaments of Mouldings.

Divide the top and bottom of the mouldings (for inſtance, the ovolo in Fig. B.) on the front ſide at top and bottom, by the ſame rule as is uſed for drawing ornaments in an elevation; from whence the ornaments in front may be finiſhed. And for thoſe on the oblique ſide, we fix a ruler at the point of diſtance to the right hand, and move it ſucceſſively to the points on the front ſide, which will give correſponding points on the oblique ſide.

In plate XXIII, is an outline; and in plate XXIV, is the Order compleated.

The MODERN IONIC ORDER.

WE are now to apply our general rules to the moſt difficult parts of architecture, for ſuch (as they relate to perſpective) are the abacus and volutes in this, and the Corinthian and Compoſite Orders; which from their various degrees of curvature, and the obliquity of their ſituations, have always been eſteemed very difficult undertakings: and I do not remember ever to have ſeen one example of this kind which was truly drawn.

Let us firſt of all conſider how theſe particular parts of architecture are conſtructed, for that will lead to the method for determining their repreſentations.

The ſides of the abacus are deſcribed from the ſummit of an equilateral triangle, and it's ends are the diagonals of ſquares (which in the poſition we ſhall give to the capital will vaniſh into the points of diſtance) and the plan of the whole is always drawn within a ſquare. Having therefore put the given ſquare for the top of it into perſpective, we ſhall have the utmoſt extent of the abacus: and by drawing lines in the plan, as in Fig. B, we ſhall obtain ſeveral principal ſections in the curvilinear parts, and from thence be enabled to produce a very correct repreſentation of this part of the capital.

Plate XXV. Let Fig. A be the elevation of half the capital, and Fig. B the plan of one quarter of the abacus.

From the corners e and d of the under part of the abacus, let fall perpendiculars to 1 8; do the ſame from any other points, a, f, g. Then 1 8 is half of the utmoſt projection of the abacus, viz. of the point c; 7 is the projection of the points b and e; 6 is the projection of the points d and f; 5 is the projection of the middle of the top part of the abacus; 4 is the projection of the point g; 3 is the middle of the bottom of the abacus; and 2 is the projection of the two points at a.

Having obtained as many points on the line 1 8 as are neceſſary for our preſent purpoſe, we will from thence determine the upper part of the abacus; for which purpoſe draw the axis of the column from any point 1 of Fig. D, and alſo the line 8 8 for the projections; then from the center 1 ſet off (from Fig. B) on both ſides (Fig. D) the diſtance of the points 1 2, 1 5, 1 6, 1 7, and 1 8, and draw a ſquare, &c. as in the

the figure, and within that ſquare draw lines from C, cutting the diagonal N M in correſponding points, as in the former examples. And having determined the places of ſo many principal points in the top of the abacus, we ſhall have ſufficient guides for drawing its true repreſentation ; all which is evident by the figures.

In the ſame manner (ſee Fig. E) is the under part of the abacus to be put into perſpective: and the lines, which paſs from C through the center 1, will (in both caſes) give the points a b; viz. the middle of the abacus for drawing the ornament, or roſe, in that place.

In regard to the volutes; we will firſt conſider the manner in which they are conſtructed by architects, and from thence deduce a method for drawing their perſpective repreſentations. The face of a volute we will ſuppoſe to be only one ſpiral line, generated by twelve centers on one plane only. It begins at the top of the ovolo, from thence it takes three revolutions, and then finiſhes in a circle; which we call the center or eye of the volute. Through this center a perpendicular is drawn, for the heights of the revolutions, and a tranſverſe line to it, for their breadths, as c d and a b, Fig. A. Now if we can find the perſpective of theſe two lines, then the height and breadth of the face of the volute will be determined: and if we can alſo obtain the heights and breadths of the revolutions, or the points on the lines a b, and c d, then we ſhall have ſufficient guides for drawing the whole face of the volute; as may be ſeen in Fig. G. But in order to do this (Fig. G) let us imagine an horizontal and perpendicular ſection to be made through the eye of the volute, as a b c d, e f g h, and that the plan of them is laid down in Fig. C, where we have three breadths of the volute, viz. that part of it which is next the column, the part in the middle, and the outſide; and therefore by transferring the neceſſary points from the line a h of the plan Fig. C, to the line 10, 10, Fig. F, we can then proceed in the ſame manner as in the former example for the abacus, taking care to fix the center 1 of the line in its proper place, and then drawing the repreſentations as expreſſed in the figure; which we ſuppoſe to be four horizontal planes paſſing through the middle of the volutes, viz. in the line a b, Fig. A.

Having proceeded thus far, let us next determine the perpendicular planes for the thickneſs of the volute in the middle; which will neceſſarily give the breadth of the top and bottom of it; as g h, e f, Fig. G.

At 2 (Fig. G) is the place for the center, or the eye of the volute placed upon the axis, and taken from the elevation Fig. A; the heights of the revolutions are alſo taken from Fig. A, and ſet off from the point 2, viz. from 2 to 1, and from 2 to 3: now through the point 5 (that is in the line which goes from the center of the eyes) draw the perpendicular 4 6; and from the point of diſtance (to the left hand) draw lines through 1 2 and 3, &c. ſo as to cut 4 6 in the points marked on 4 6. Again, through the center on the face of the volute, draw another perpendicular, 7 8; then from the other point of diſtance (to the right hand) draw lines through the ſeveral points between 4 and 6, and then we ſhall not only compleat the perpendicular plane, but ſhall alſo have the true heights of all the revolutions on the line 7 8; and from which this volute may be finiſhed.

Having thus obtained one of the volutes, the other two, which are viſible, may be drawn from it. Thus, through the eyes of the other volute in front draw perpendiculars, as e g, f h; then parallels from the parts of the volute already drawn will give correſponding points in this; and the parallels from 7 and 8 give the points e g, &c. In like manner, if a ruler be laid to the point of diſtance and to the ſeveral points on e g, we ſhall obtain correſponding points on the line i k.

From what has been ſaid (and by inſpecting the figures with a little attention) we may eaſily conceive how an outline Fig. H of this capital may be drawn: though it muſt be confeſſed that with all theſe

helps, much will depend on the ſkill of the artiſt, and eſpecially if he does not confine each face of a volute to one plane only. For if the revolutions are made to ſpring out from the plane at the begining, we ſhall have ſuch a variety of different curves as will vaſtly ſurpaſs my comprehenſion; and which (to reduce truly into perſpective) might probably evade the utmoſt efforts of the moſt able mathematician. Indeed, the projections of the middles of each revolution, might be obtained by the horizontal plane, which paſſes through the eye of the volute; but this would be of no great aſſiſtance, ſince any tolerable draughtſman may, from what is already laid down, do ſufficiently well without it.

Before I conclude with this example, it may be neceſſary to reduce the rules into ſome order, which I have hitherto given in a promiſcuous manner for the ſake of keeping the parts more clear and diſtinct. And therefore

1. Give the elevation A.

2. Find the plan B, and draw the perpendiculars, &c.

3. Draw the plan C, &c.

4. Give the axis of the column, and the top of the abacus as in D; then find the top, and draw ſo much of it as is viſible; marking the middle of it in x, and rubbing out the pencil lines.

5. Produce the under part of the abacus; draw in with ink, and rub out the pencil lines, as in Fig. E.

6. Finiſh the abacus as in Fig. E and F.

7. Upon the axis put the height of the eyes of the volute, and draw the horizontal planes as in Fig. F.

8. Set off the heights of the ſeveral revolutions upon the axis as in Fig. G, and determine one volute.

9. From this volute obtain the others, by parallels, &c.

10. Finiſh the outline as in Fig. H.

11. And compleat the capital as in Fig. K.

The CORINTHIAN ORDER.

IN this Order I ſhall have little more to do than to apply the general rules in drawing the leaves of the capital. For the abacus and volutes are to be obtained by the method which is ſo fully explained in plate XXV of the laſt Order; and the manner of drawing the modilions is much the ſame as that for determining the perſpective repreſentations of the dentals in plate XXII.

Indeed, in this capital there are ſmaller volutes between thoſe placed at the corners; but I apprehend, that no new or material difficulty, can ariſe on this occaſion to any one who has the leaſt facility in drawing, or that is tolerably ſkilled in architecture. And I moreover imagine, that a minute detail of ſo complex an object as this, would be neither entertaining nor inſtructive. For, were I (like Pozzo) to aim at great exactneſs, it might indeed amuſe the eye, and at the ſame time confound the underſtanding: and after a tedious and intricate operation, we ſhould gain no more ground than what may immediately be acquired by theſe rules of much greater ſimplicity; for, in both caſes, much muſt depend on the hand and ſkill of the performer. And I believe there are very few artiſts who will not readily acknowledge, that a few ſtrokes properly placed, will give a more perfect idea, and be of much greater aſſiſtance to his hand in drawing any object, then putting him into the leading ſtrings of ſcience,

and

and guiding him ftep by ftep, through the intricate mazes of lines and points. Thus much may fuffice, for my brevity in fhewing how to put the Corinthian and Compofite capitals into perfpective. We will now proceed to the matter immediately before us.

Plate XXVI. In Fig. 1, I have given an elevation of the capital, with the parallel lines which determine the heights and projections of fo many parts as are neceffary for the prefent purpofe: and at Fig. 2, one quarter of the plan for obtaining the abacus; the general procefs of which is reprefented by Fig. 3 and 4; and this brings us to Fig. 5, for the leaves, &c.

In the firft place, let us obferve that this capital is compofed of two fimilar rows of leaves, whofe heights and the turning down of the leaves are given in the elevation Fig. 1. Each row contains eight leaves; and the fecond row of them is fo placed, as to have one leaf fall directly in the middle of each front of the capital, and confequently the other four leaves in this row are placed directly under the corner of the abacus, and therefore the ftalks, or middle of thefe leaves will be exactly in the points which we have all along made ufe of for drawing the perfpective of a circle, viz. book I, example 8, of fection 3. And fince the firft row of leaves are placed exactly between the ftalks of the former, therefore having determined the places for the fecond row, thofe of the firft may be drawn from thefe, as will beft appear by the operation.

Let Fig. 5 be the center for the bottom of the capital, and p p the diameter for the bafket, as taken from Fig. 1.

1. Find the perfpective of a circle from the given diameter p p, and make the eight points as in the figure.

2. Take (from Fig. 1) the heights r g, r d, of the fecond row of leaves, and of their turnings down; (as expreffed by the curved lines s f c e) and transfer them on Fig. 5, from r to g, d.

3. Draw through g and d, the parallels e e, c c, and make them refpectively equal to the correfponding lines g e, d c on Fig. 1.

4. Take the projections of thefe lines from Fig. 1, and transfer them to e e, c c, Fig. 5, marking each with a dot, as c, e, f.

5. With the diameters e e; f f; c c, draw the perfpective of three circles, expreffed by the dotted lines; and in each circle, mark the eight dots as before.

6. Through thefe dots draw curved lines, as expreffed in Fig. 6, which will give all the ftalks, or middle of each leaf that are vifible in this fituation of the capital.

7. Having obtained the ftalks, and the heights of the turning down of the leaves, next fketch in the general fhape of each leaf, as in Fig. 7: and from thence this part may be compleated.

Again; for the firft row of leaves.

The widths, as was obferved above, are obtained from the fecond row already drawn; and therefore only the heights and turnings down are wanted for compleating thefe alfo: and for this purpofe, fet off the heights and projections from the elevation Fig. 1 to Fig. 5, and from thefe find the perfpective of two other circles, as in Fig. 6, which produces what was required.

I fhall now fhew how to determine the extremities of the outer volutes, which line will likewife be a guide for the upper leaves, viz. thofe which go directly under the volutes.

Now, imagine an horizontal fection to be made through the middle of the volute, as a b, Fig. 1.

1. Transfer the line a b from Fig. 1 to it's proper point b, Fig. 7, and fet off the projections b a, b o.

M

2. From

2. From theſe two given projections, find the appearance of two ſquares, as expreſſed by the dotted lines in this figure; and the lines of the ſmaller ſquare being continued to the ſides of the outer one, will give four little ſquares, the diagonals of which will be for the thickneſs of the outer parts of the volute, which will tend to the points of diſtance.

Thus much, I preſume, is ſufficient for compleating the capital, as in plate XXVIII and XXIX.

All that now remains to be conſidered, is the method of drawing the modilions.

Plate XXVII. In Fig. 1. is the elevation of an entire modilion. At Fig. 2. the projections on F F of the ſeveral parts are transferred, from the line a b, Fig. 1; and by this means (as in the Doric ſoffit, plate XVIII, Fig. E) I determine the top of the modilions as in the figure: and in the ſame manner find one part after another of the capitals to each modilion, till all of them are compleated.

For the under parts, and for the lines which ſerve as guides for the leſſer volutes; we take the heights and ſet any where from a, Fig. 3, on the axis A B, and then by transferring the ſeveral projections from the line c d e, Fig. 1. we ſhall obtain all the blocks for the modilions, and then draw in the ornaments, as Fig. 4: but we are to remember that the point a is ſuppoſed to coincide with the point B.

Plate XXVIII and XXIX, contains a perfect out-line of the whole order, and a finiſhed example of it.

The COMPOSITE ORDER.

PLATE XXX. We ſhall not take up the learner's time, in ſhewing him how to delineate this Order, becauſe his own reflections will eaſily point out the method for drawing the whole of it, as repreſented in the out-line of this plate.

For he is ſuppoſed to know how to produce the baſe and pedeſtal, from what he learned in the Tuſcan Order, &c. and the leaves of the capital being of a ſimilar nature with thoſe of the Corinthian; and the volutes and abacus the ſame as the modern Ionic capital; therefore the ſame rules, made uſe of for producing thoſe, will ſerve for theſe alſo. The entablature differs in no part which demands attention, for even the modilions muſt appear very eaſy from the rules laid down on plate XXVII.

Plate XXXI. Exhibits a view of the whole order compleated: and with this we ſhall conclude all that was propoſed in this chapter, viz. conciſe and eaſy rules for reducing the whole and every part of an order of architecture into perſpective, with facility and exactneſs.

BOOK

BOOK III.

CHAP. I.

General Rules for determining the perſpective of Shadows.

HAVING ſhewn how to delineate the five Orders of architecture, I am naturally led to the conſideration of buildings, and therefore ſhould now have proceeded with applying the rules in drawing more complex parts of architecture, ſuch as colonnades, arches, &c. but ſince I propoſe to give as much correctneſs and elegance to thoſe objects as I poſſibly can, it therefore becomes neceſſary, in the firſt place, to ſhew how to determine the appearance of ſhadows, which I ſhall principally do by one general, or univerſal rule.

THAT true principles for drawing the ſhapes of ſhadows upon a picture are of the utmoſt conſequence, is a truth I apprehend not to be controverted; and therefore an attempt to carry this part of perſpective farther than has yet appeared in any author, will have ſome claim to the attention and candour of the public.

I do not preſume to ſay, that no deviation is to be made from the doctrine I ſhall advance on this part of perſpective; for poſſibly there may be ſome caſes in which it will be better for the artiſt to be guided by his own diſcretion only: but this can no more render the following examples unneceſſary, than the uſe of ſpectacles to aſſiſt the eyes of him who cannot ſee perfectly without them.

IN my former book upon perſpective, I have particularly conſidered the doctrine of light and ſhadow, and have there ſhewn how to determine their projections upon a variety of planes, when they are either perpendicular, parallel, or inclined: and much more may be ſaid upon it. However, a ſmall degree of knowledge in the theory of this part, will fully anſwer our preſent purpoſe: for, as was obſerved above, it may principally be deduced from one ſimple rule only; which we will now proceed to explain. §

§ PLATE XXXIII. Fig. A. viz. by Fig. 1. Suppoſe *a b* to repreſent any given object perpendicular to the ground, which is here repreſented by the indefinite plane *a d f e*.

Let *b e* repreſent a ray of light, having any given inclination, which is here expreſſed by the angle *a e b*: then will the line *a e* be the length of the ſhadow caſt upon the ground by the given object *a b*, whence by Trigonometry, $S.\angle aeb : ab :: S.\angle eba : ae$.

Therefore the length of the object *a b* being known, as alſo the angle of inclination *a e b*, which the ray of light makes with the ground, the length of the projected ſhadow is readily determined, as above. But if the length of the ray of light were given inſtead of the angle of inclination, then *a e* might be found by (Euc. 1. 47.)

Now let *d c* be alſo a given object equal and parallel to *a b*; then are the lines *b c*, *a d*, equal and parallel one to another, (Euc 1. 33) and the common ſection of the two planes *a b c d*, *a d f e*, is the right line *a d* (Euc. 11. 3) Now becauſe the planes *a b c d*, *a d f e*, are perpendicular to each other, the angle *b a e* is a right angle, as is alſo the angle *c d f*.

Let *c f* be a ray of light, having the ſame degree of inclination as the ray *b e*, then will the line *c f* be equal to *b e*, and the angle *f c d* equal to the angle *e b a* (Euc. 1. 26) therefore the triangles *b a e*, *c d f*, are entirely equal, and have their correſpondent ſides equal each to each (Euc. 1. 4) *d f* is therefore equal to *a e*. Since the triangular planes *b a e*, *c d f*, are each perpendicular to the ground plane, and parallel one to another (Euc. 11. 14) therefore *d f* is alſo parallel to *a e*, wherefore *e f* is equal and parallel to *a d* (Euc. 1. 33) and therefore *e f* and *b c* are alſo equal and parallel (Euc. 1. 30) Hence it appears, that the right lines *a e*, *d f*, are the ſections made by the indefinite, or ground plane, and the triangular planes *b a e*, *c d f*, and that *a d*, *e f* are the ſections made by the planes *a b c d*, *e b c f*, with the ground plane *a d f e*, therefore the ſhadows of the points *b*, *c*, are projected on the ground in the points *e*, *f*, that of the lines *a b*, *d e*, in the lines *a e*, *d f*, and the ſhadow of the whole plane *a b c d*, is projected in the plane *a d f e*.

Whoever will make obfervations on the effects of fun-fhine, as he paffes by buildings, will be greatly affifted in comprehending the following fchemes; for the original hints of every example were taken from nature, and the mathematical reader may fee, by the annexed note, that the manner of drawing them in this work is not inconfiftent with the principles of geometry.

Shadow is caufed by the interpofition of opaque objects, which ftop the rays of light in their paffage from the fun, or any other luminous body. But it is the rays that come from the fun only, which I fhall particularly attend to in this place.

The fhadows, that are projected by the fun, are, in refpect to it's immenfe diftance from us, confidered as parallel: wherefore the fhadows of regular objects, which are caft upon fmooth or even planes, will (generally fpeaking) be fimilar to the objects that project them; this may be conceived from obferving the fhadow of a poft, a pillar, &c. upon the round.

But fhadows that are projected upon round, cylindrical and uneven furfaces, will have various forms, and oftentimes will be fo very intricate, as to puzzle the moft acute and able mathematician; and therefore I fhall content myfelf with fuch helps, in thefe difficult cafes, as may, if required, admit of demonftration; but I will not give my readers the trouble and perplexity of it in the body of this work.

Plate XXXII. Fig. 1. Suppofe A L the horizontal line, and the figures A, B, E, F, G, M, to reprefent the fun gradually afcending from the horizon at A, to it's meridian height at M; or defcending from it's meridian M to the horizontal line at A, and in both cafes, fending forth it's rays to the point N. Then the different angles made by the rays B N &c. with the horizontal line A N, will fhew the angles of the fun's inclination.

Now let us fuppofe that the fame object is placed in fuch a manner on the horizontal line A N, as to touch the feveral rays of light as they pafs from E, F, G; and it will be evident that thefe objects 1, 2, 3, will feverally caft a fhadow as far as the point N, upon the plane on which the objects are fixed. For fince the fun paffes over the top of each object, and makes a triangular plane with it and the horizontal line, therefore the whole fpace comprehended within that figure, may be confidered as fhadow, like Fig. X. But the fhadows of all the objects will be either the whole, or elfe a part of the line 1 4.

Again, by attending to the figure, we fhall perceive, that the length of the fhadow from the object 1, reaches to 4; thofe of the objects 2 and 3, are terminated at 4 alfo: fo that the fhadow of the object 1 is longer than the fhadow of the object 2; and the fhadow of the object 2 is longer than the fhadow of the object 3. But the object 4 being placed directly in the meridian M N, it therefore cannot

not

Plate XXXIII. Fig. X. viz. by Fig. 4. The planes 1 2 3 4, 5 6 7 8, are fuppofed to be parallel to each other, and perpendicular to the ground, or indefinite plane 1 2 0 9.

The plane 3 4 0 9, is a plane of rays of light iffuing from the line 3 4 of the plane 1 2 3 4, fo as to interfect the plane 5 6 7 8, as here in the line 7 8. Now becaufe the lines 3 4, 7 8, are the common fections of thofe two planes, they are therefore parallel (Euc. 11. 16) And becaufe the lines 4 8, 3 7 are equal and parallel, therefore 3 4, 7 8, are alfo equal and parallel (Euc. 1. 33.)

Now feeing the lines 1 3, 5 7, are parallel, the fides of the triangles 3 1 9, 7 5 9, are proportional (Euc 6. 2) therefore 9 5 : 9 1 : : 5 7 : 1 3. And for the fame reafon 0 6 : 0 2 : : 6 8 : 2 4. And as 9 5 : 5 7 0 6 : 6 8. But 9 5 is equal to 0 6, therefore 5 7 is equal to 6 8; and therefore 7 8 is equal and parallel to 5 6. And becaufe 9 5 is equal and parallel to 0 6, therefore 0 9 is equal and parallel to 5 6, and alfo to 7 8; whence it is manifeft that the fhadow of the point 3 is projected on the plane 5 6 7 8 in the point 7, and that of 4 in the point 8; and therefore the line 7 8 is the projection of the fhadow of the original line 3 4, when caft upon the parallel plane 5 6 7 8.

Although what has been here advanced, with regard to fhadows projected on the ground, from objects that are perpendicular to the plane of the horizon, is true with refpect to the bufinefs of perfpective; yet it is not to be inferred from hence, that, univerfally the fhadows fo projected are right lines; for this, in mathematical ftrictnefs, is otherwife, the fhadow being in one cafe a right line, and in others is fome one of the conic-fections. For inftance, when the fun is directly over the equator, the fhadow is projected into a right line; but it is a parabolic curve, when the diftance between the zenith and the pole of the place is equal to the fun's declination; and in other cafes it will be either an elliptical or hyperbolical curve. And here alfo it is to be farther obferved, that thofe curves will be concave to the object that cafts the fhadow only when the latitude of the place, and the fun's declination, are both of the fame name, that is, both north, or both fouth; for when they are of different names, or one north and the other fouth, then thofe curves are projected fo as to be convex to the object that produces them; but thefe are particularities that have no place in perfpective reprefentations, but neverthelefs neceffary to be mentioned in this place.

not have any ſhadow projected upon the ground. But this happens only in the torrid zone, for in this part of the globe, the ſun is never vertical, and therefore there will always be a ſhadow caſt by him at noon; though it will be then ſhorter than at any other time of the day, and much more ſo in the ſummer than in the winter ſolſtice.

From hence we ſee the reaſon why the ſhadows of objects are very long in a morning and evening, but ſhorter and ſhorter as the ſun approaches it's meridian altitude.

There are three different directions in which the rays of light are ſuppoſed to come upon a picture, viz.

1. In a parallel direction; in which caſe the ſhadows will be parallel to the horizontal line like Fig. 1.

2. When the light comes from before the picture, and conſequently, falls upon the front of it; and then the ſhadow is caſt towards the horizontal, as in Fig. 2.

3. When the light is ſuppoſed to come from behind the picture, and ſo projecting the ſhadow towards the bottom of it; as in Fig. 3.

If the ſhadow upon a picture is to be obtained by example 1, then that ſide of the object only, which is towards the luminary will be enlightened, and the front part of it will receive what is called a half ſhadow. And if the light is ſuppoſed to come from behind the picture, then the front ſide of every object will be wholly in ſhadow; ſince it cannot receive any other degree of light, than what is reflected to it, from objects that are illuminated, and placed near to it. It is by this ſecond rule, that the various degrees of light, and the directions of the ſhadows, which are neceſſary for repreſenting the effects of the riſing or ſetting ſun, and of moon-light, are to be determined; for in other caſes, an artiſt will not make this a rule for his light and ſhadow, ſince it muſt neceſſarily deſtroy the whole effect of his picture. But it is the ſecond example that I ſhall particularly attend to; for it is this only which can fully anſwer my preſent purpoſe: however, for the ſake of regularity, I ſhall juſt ſhew how to find the ſhadows from each of the objects, Fig. 1, 2 and 3, and then turn my attention wholly to the rule in the ſecond figure.

C A S E I.

When the light comes in a parallel direction.

Fig. 1. Let I K be an object placed perpendicularly upon the ground, with the light falling upon the left hand, and projecting a ſhadow in a parallel direction.

From the bottom I of the object, draw the parallel I e; and give any inclination for the light, as K g; this being done, then K g cutting I e in g, will give I g for the ſhadow of I K. The ſame may be ſaid of the other inclinations of the rays of light, viz. K f, K e, K b and K a.

N. B. Theſe inclinations, are drawn parallel to the rays A N, B N, &c, which ſhews as above, the different lengths of the ſhadow, and alſo that the ſhadow will be of an infinite length when the ſun is at A viz. when it is in the plane of the horizon.

Observ. We may eaſily comprehend the nature of this ſhadow, by imagining either of the planes of rays, viz. I K g, &c. to be like the plane X, drawn upon the picture, as a triangular plane only that is the parallel to the eye; then conſidering the perpendicular ſide I K as the object; and the hypotheuenſe K g as a ray of light cutting the baſe I g in the point g. And the ſame obſervation will hold good as to the two following caſes; ſince the ray of light (which in both examples) produces the ſhadow of the object, is to be conſidered as the hypotheuenſe of a right angular plane, which ſtands perpendicularly upon the ground, but is obliquely ſituated with reſpect to the picture; and for this reaſon, the vaniſhing point L of theſe rays will be ſomewhere in the line S L, that is drawn from the vaniſhing

point S of the bafe I k of the triangle I K k. In cafe 2, the vaniſhing point L of the rays will be below the horizontal line; and in cafe 3 it will be above the horizontal line. The truth of all this is more fully explained in my former book upon this fubject.

CASE II.

When the light comes from before the picture.

Fig. 2. Give I K for the object, whofe ſhadow is fought; then from the bottom of it I, draw a line at pleafure (fuppofe to S.) From S let fall the perpendicular S L, and take the point L at pleafure alfo; then from L draw a line to K, cutting I S in k; and then the line I k is the ſhadow of the line I K, &c.

N. B. the plane X, annexed to this figure, is drawn to give an idea of the obliquity of the rays of light; which is expreffed by the plane's being turned from the parallel line 1 2.

CASE III.

When the light comes from behind the picture.

Fig. 3. Through the bottom of the object draw a line, as before, to any point S in the horizontal line; draw alfo the perpendicular S L, and give the point L at pleafure; then from L draw through K to cut S k in k; and fo will the line I k be the ſhadow of the line I K, &c.

Now that one rule only will in general be fufficient for a great variety of objects; and may, partly, be comprehended in the next figure.

Fig. 4. To determine the ſhadow of an Obeliſk.

1. Find the feats of each of the upper corners A, B, C, D, as they are marked at the bottom with correfponding letters a, b, c, d.

2. From any point e, draw a line at pleafure to the horizontal line, and call S the vaniſhing point of the ſhadow.

3. Let fall the perpendicular S L, and take the point L at pleafure alfo; and call it the vaniſhing point of the rays of light.

4. From L draw to C (which correfponds with c) and then is c b the ſhadow of the line C c.

5. Do the fame from the other points a, d, b, &c.

6. From the corners 2 and 4 draw lines to c and d; and from c through b to c; laftly, draw the parallel b d, which finiſhes the ſhadow.

Fig. 5. In this figure I have attempted, not only to ſhew how the ſhadow on the ground is to be gradated, or made fainter and fainter the nearer it approaches the horizontal line; but alfo to adapt the peculiar degree, or tone of the ſhadow to the peculiar colour of the parts 1, 2, 3, 4, 5, and 6. For this is a fundamental principle for producing a good effect; but it being much eafier to conceive in theory, than to explain by practice, I ſhall therefore only offer this hint upon it.

From what has been already done, I ſhall be enabled to proceed in a regular manner: and by putting the following fchemes under general heads, I ſhall take in fome of the moft material cafes of light and ſhadow, which we obferve in nature.

In the firft place we muft confider the ſhape and fituation of the object, whofe ſhadow is wanted. And fecondly, the direction we propofe giving that ſhadow, or which is the fame thing, the manner in which we propofe to make the light come upon the pictures. Now the three following examples will give a more perfect idea of thefe particulars.

EXAMPLE

EXAMPLE, I.

PLATE XXXIII. Fig. 1. To find the perfpective reprefentation of the fhadow, caft by the parallel object A B D F, when the fhadow vanifhes into the center C of the picture.

1. Let a b (Fig. A) be confidered as A D (Fig. 1) and let b e (Fig. A) be called a ray of light, projecting the fhadow a e.

2. Any where apart, draw the line 2 3 at pleafure, but parallel to the horizontal line; in the fame manner draw the perpendicular 2 1; and at the point 3, with the line 2 3, make an angle equal to the inclination of the rays of light (that is equal to the angle b, Fig. A) then draw 3 1, cutting 12 in the point 1; and then is the triangle 1 2 3 fimilar to the triangle e a b; and confequently the angle at 3 fhews the inclination of the rays of light; that is the height we fuppofe the fun to be above the horizon.

3. From C (the vanifhing point of the fhadow) let fall the perpendicular C L, and give C E for the diftance of the eye; then from E draw E L parallel to 3 1, cutting S L in L; and then is L the vanifhing point of the rays of light. §

4. Draw from B to C, and from F draw a line to L; and then is B f the fhadow of B F. Again, draw a line from A to C, and another line from D to L, which will give the point d, and thereby the line A d for the fhadow of the line A D: and by joining d f, the whole fhadow will be finifhed.

OBSERV. 1. Remember that this fhadow is obtained by twice repeating the rule in figure 2, plate XXXII, viz. by firft finding the fhadow of B F, and then of A D.

OBSERV. 2. Becaufe the top D F of the object is parallel to the horizontal line, therefore the fhadow of it, viz. d f, will be parallel to the horizontal line alfo.

OBSERV. 3. When the fhadow vanifhes into the center of the picture, as in this figure; then the light comes from directly before the picture; and then the fides, or parts of objects, which tend to the center C will be enlightened; but the front fides will be the lighteft.

EXAMPLE, II.

FIG. 2. For the fhadow of a parallel object A B D F, when it does not vanifh into the center of the picture, but into any other point, as S.

1. Draw B S, and then the perpendicular S L at pleafure.

2. From the center C of the picture, draw the perpendicular C E, and call C E the diftance of the eye; then draw S E, which is the diftance of the eye from the point S.

3. From S, with the radius S E transfer the diftance to E 2; and at E 2 give the angle of inclination for the fun's rays, and draw E 2 L, cutting S L in L; then is L the vanifhing point of the rays of light.

4. Draw a line from F to L, cutting B S in f; and then is B f the fhadow of B F. In the fame manner find the fhadow A d of A D, and then join d f.

OBSERV. From this, and example 1, we may conceive how the fhadows will encreafe or decreafe in length, as the point L is nearer to, or farther from the point S; for which reafon it is neceffary to make this point at fuch a diftance as will prevent the fhadows being either too fhort or too long.

OBSERV. 2. And from hence alfo it follows, that the vanifhing point S of the fhadow, fhould be carried at a confiderable diftance out of the picture, fince by that means the various fhadows projected upon it, will the better correfpond with each other.

§ See Dr. Brook Taylor's Perfpective made eafy, &c. Book 1. chap 5. fect. 1. lemma. 3.

EXAMPLE III.

Fig. 3. For the ſhadow of an object A D F B that vaniſhes into the center of the picture.

1. Draw at pleaſure a line from one corner A, to the horizontal line at S.

2. From S let fall the perpendicular S L, and find the point L as in the laſt example.

3. Draw a line from B to S, and alſo from D and F to L, cutting A S in d, and B S in f; then join d f, which compleats the ſhadow.

Observ. Since the top D F vaniſhes into the center of the picture, therefore it's ſhadow d f will vaniſh into that point alſo.

This is ſufficient for ſhewing how the ſhadow, that is caſt upon the ground by any upright object, is to be determined upon the picture. For let it be ever ſo complex a figure, we have nothing more to do than to find the ſeats, or plans of ſome principal points in the perſpective, as a, b, c, d, Fig. 4 of Plate XXXII; and then proceeding in a regular manner, by finding the ſhadow of one point, or line at a time, till the whole be compleated. All which will be made very obvious in the courſe of this work.

EXAMPLE, IV.

Fig. 4. For the ſhadow of an upright object A B, when part of it is caſt upon a wall F D, that intercepts it from the ground.

1. Give the points S and L at pleaſure, and then draw A S cutting the bottom of the wall in 1; then from 1 draw the line 1 b parallel to A B; or, which is the ſame thing, perpendicular to the bottom of the wall.

2. From B draw to S, cutting 1 b in b; then is b the ſhadow of the end B, and conſequently a 1 b is the whole ſhadow of a line A B, &c.

In like manner, F e is the ſhadow of F E; and e d is part of the ſhadow of the top E D, which is alſo parallel to it. If the wall was wholly taken away, then A a would be the ſhadow of A B.

Observ. From hence we may ſee, how any other ſhadows, that are caſt by ſimilar objects upon upright planes, may be determined; ſince nothing more is required than a repetition of the ſame rule; which is fully exemplified in the five following figures.

EXAMPLE V.

Fig. 5. For the ſhadow of an object A B, when the light comes as in the laſt examples; and to determine that of the croſs-piece at the top, viz. E D.

1. Find the ſhadow A 1 b of A B, as before directed.

2. Through A draw the perpendicular A 3, and make A 3 equal to B E; then from 3 draw 3 2, cutting the bottom of the wall at 2.

3. From 2 draw 2 e parallel to 1 b, and from E draw to L, cutting 2 e in e; then is e the ſhadow of E, therefore draw a line through e b, and continue it at pleaſure; draw alſo a line from D to L, cutting e b continued in d; and then is e d the ſhadow of E D.

Observ. Since E D is parallel to the horizontal line; therefore the ſhadow of it, e d, will be parallel to the horizontal line alſo.

EXAMPLE VII, VIII, IX.

Fig. 7, 8, 9. It is quite needleſs to ſhew how to determine the ſhadows in theſe figures, becauſe one glance of the eye will ſhew, that all of them are deduced from the laſt example; and the correſponding letters will point out the peculiar ſhadow of each point, &c.

Plate

Observ. In Fig. 5, the line A B may be confidered as a column, and D E as the abacus of a capital. In Fig. 7 I had an eye to a colonnade of two columns, with an architrave over it. Fig. 8 ſhews the manner by which the ſhadow of an angular pediment is to be obtained: and Fig. 9 points out the method for determining a ſhadow from the circular pediment.

EXAMPLE, X.

Fig. 6. For the ſhadow of an upright object, when it falls upon more than two planes; and to find the ſhadow of any part of it; and alſo how to determine the ſhadow of the whole figure upon the ground.

1. Draw a line from A to the horizontal line S, &c. cutting the bottom of the ſtop in 1; then from 1 draw 1 2 parallel to A B; and from 2 draw to S, cutting the bottom of the wall in 3; then from 3 draw 3 b parallel to A B, and draw from B to L, cutting 3 b in b, which gives A 1 2 3 b for the whole ſhadow, as was required.

Again; If from any points in A B, we draw lines to L, their interſections with the ſhadow already drawn, will determine the places of thoſe points.

EXAMPLE, XI.

Plate XXXIV. Fig. 1. For the ſhadow of a parallelopipedon A F, as it is caſt upon a wall.

1. The points S and L being taken at pleaſure; draw from the lower corner A to S, cutting the wall in 1; and from 1 draw 1 b parallel to A B; then draw from B to L cutting 1 b in b; and then will A 1 b repreſent the ſhadow of the line A B.

2. From the other corners, as D, proceed in the ſame manner, and find the ſhadows e and f of E and F; then join e f, and f b, which finiſhes the ſhadow.

Observ. 1. All ſhadows that are caſt by lines (or the edges of objects) upon planes parallel to them, will be parallel to thoſe original lines; thus 1 b is parallel to A B; and e f is parellel to E F.

Observ. 2. The ſhadow e b of the ſide E D that vaniſhes into C, will be parallel to the line L C, which is drawn from the vaniſhing point C of the object to the vaniſhing point L of the rays of light.

N. B. Theſe two obſervations will be of great uſe in moſt of the following figures.

EXAMPLE XII.

Fig. 2. For the ſhadow of a cylinder upon a wall.

1. Give the points S and L; then make any number of points on the top of the cylinder, and find the ſeats of thoſe points by means of the dotted lines as in the figure; thus A is the ſeat of B, and D is the ſeat of E, &c.

2. From A draw to S, and from B to L, &c. which gives b for the ſhadow of B; the ſame done from D and E will produce the point e; and by repeating the operation quite round the figure, we ſhall obtain the ſhadows of all the points marked on the top of the object; and from thence be enabled to draw the curved line as in the figure; which will repreſent the ſhadow of the top of the cylinder as projected on the wall. The whole ſhadow is expreſſed by ſhading, &c.

Observ. If we would find the ſhadow of a circle only, (ſituated like the top of a cylinder) we muſt firſt find the ſeats of any number of points on the top upon the ground, and then proceed as above.

EXAMPLE XIII.

Fig. 3. For the ſhadow of one cylinder, caſt upon another; when the light comes in directly before them.

1. Find the ſeats of the points A, B, D, &c.

2. From the feat 1 of the point A draw to C, cutting the bottom of the cylinder in 2; then from 2 (if need be) draw the line 2 a at pleafure, but parallel to A 1; and then, as before, A L gives the point a for the fhadow of the point A; and 1 2 a for the fhadow of 1 A.

3. Repeat the operation quite round the figure, and fo obtain the perfpective of the whole fhadow, as is expreffed in the figure: where the correfponding letters mark the fhadow of each point, and confequently the curved line that is drawn through them, will be the fhadow of the top of the cylinder, &c.

4. A line drawn from K to L, gives the fhadow k of K on the ground, &c.

Observ. In both the laft figures, the dotted lines drawn from the tops of the cylinders to L, may, in fome meafure, give an idea how the cone of rays is interfected by the plane that receive the fhadow.

EXAMPLE XIV.

Fig. 4. To determine the fhadows of Cylinders, when the light comes in a flanting direction; and alfo of Soffit, or board laid upon the top of the Cylinders; and likewife to find the fhadow upon the ground.

N. B. the cylinders vanifh into the center of the picture, and the width of the board upon them is equal to the diameter of the cylinders.

1. From C, draw lines to touch the outer parts of the bottom of the firft cylinder at 6; and that part of it, which is between the cylinders, will reprefent the feat of the board upon the ground.

2. From S draw a line to touch the bottom of the fartheft cylinder at 4, and alfo to cut the line 7 1 in the point 1.

3. Then from 1 draw the perpendicular 1 B, cutting the outward edge of the board in B; then from B draw a line to L, and the line 4 b parallel to 1 D; and then is b the fhadow upon the cylinder of the point B; and the line 4 b determines the part where the upright fhadow meets the light.

4. Find the feat 2 of the point D, and from 2 draw to S; then from 3 (where 2 3 cuts the bottom of the cylinder) draw the perpendicular 3 a, and then draw a line from D to L, cutting 3 a in a; fo will a be the fhadow of D; therefore draw a curved line through the points b, a, meeting the foffit; which will be the fhadow required.

For the fhadow upon the ground.

First, find the feats of the four corners of the board (as 5, which is the feat of A) then draw 5 S, and then A L gives d for the fhadow of A. In the fame manner find the fhadows of the other corners of the board, and draw lines from S, fo as to touch the bottom of the cylinders, as in the figure.

Observ. Here the fhadows of the fides of the cylinders vanifh into S; and becaufe the fides of the board vanifh into C, therefore the fhadows projected by them will vanifh into C alfo; but the ends of the board being parallel, will caft fhadows which are parallel alfo.

EXAMPLE XV.

For fhadows that are projected, either upon the concave or convex fide of a Cylinder.

Firft, for the convex fide.

Fig. 5. The figures that project the fhadows are X and Z. Now, from the preceeding examples it is evident, that the fhadow of the edge A B of the object Z, is A 1 b; which with the other parts of the fhadow are obtained by one and the fame rule, viz. Fig. 4, plate 33.

Secondly, for the concave fide.

Fig. 6. Here the concavity of the object makes no alteration as to the rule, nor yet in the application of it.

EXAMPLE

E X A M P L E, XVI.

For the ſhadow of a perpendicular Plane A F, joined at right angles to another that is parallel to the eye; and to determine the appearance of the light when it paſſes through a door, or window.

Firſt, for the perpendicular Plane.

Fig. 7. From the corner A draw lines to S, &c; and from G to L will give the ſhadow g; therefore join g F, which is the ſhadow ſought.

Or having drawn 4 g at pleaſure, then from L draw through C, and then a line from F parallel to L C, which will give the ſhadow F g of F G.

Secondly, for the door.

Draw lines from the bottom, then perpendiculars from 3, 2; and lines drawn from D, E to L will give the ſhadow e d of E D; therefore join e d. Here e d is parallel to L C; for E D vaniſhes into C.

Observ. This example is of uſe in finding ſhadows that are projected into rooms, &c.

E X A M P L E XVII.

For the ſhadow of an horizontal Plane when it is joined to another at right angles, &c.

Fig. 8. From L draw a line through C the vaniſhing point of A B, and from A draw to L, then from B, a parallel to L C cutting A L in a; then is a B the ſhadow of A B: and another line a d drawn from the point a, and parallel to A D, will give a d, for all the ſhadow of A D that can fall upon the plane B d.

And for the ſhadow upon the ground: here 1 and 2 are the ſeats of A and D; and the ſhadow of D is the point 3, &c.

E X A M P L E XVIII.

For a variety of ſhadows, which will be more particularly applied in ſome of the following examples.

Fig. 9. Firſt, for the ſhadows of three perpendicular objects, A B, G E, H F, as they are projected on different planes.

1. Draw from A to S, and then from B to L will give b for the ſhadow of B. Or from D draw a parallel to L C which will give D b; and the ſhadow of E B likewiſe.

2. A line drawn from G to S, &c. and another from E, gives e for the ſhadow of E; and e 3 G for the whole ſhadow of G E.

3. From H to S, &c. and from F to L will produce f for the ſhadow of F; and f 4 H for the ſhadow H F.

Secondly, for the ſhadow of the line E F.

The point e is the ſhadow of E, and f is the ſhadow of F; and ſince F E is a parallel line, therefore its ſhadow e 6, which falls upon a parallel plane, will be parallel alſo; and another part of the ſhadow is obtained by joining f 6. Or the vaniſhing point of the ſhadow f 6 may be found thus, viz. from C (the vaniſhing point of the plane P R S O) let fall the perpendicular C M at pleaſure, and from L draw a parallel M L, cutting C M in M; and then is M the vaniſhing point of the ſhadow f 6.

Thirdly, for the ſhadows projected by the ſide E N, and top N O of the figure.

Draw from Q to S, and from 2 the perpendicular 2 n at pleaſure; then a line from L to N, &c. will give n 2 Q for the ſhadow of N Q; and e n will be the ſhadow of E N: and ſince n is the ſhadow of N, therefore the parallel e C will be part of the ſhadow of E B, and the parallel n 5 will be part of the ſhadow of O N, but the other part, viz. O 5, will vaniſh into M.

Observ. This figure is calculated to anſwer many uſeful purpoſes, and therefore the learner will do well to underſtand it perfectly.

EXAMPLE XIX.

Plate XXXV. Fig. 1. For the ſhadow of a ſquare object caſt upon a cylinder.

Take any number of points on the under part of A B (for it is this edge which projects the ſhadow) and draw lines to S; and from where theſe lines cut the top of the cylinder, draw lines parallel to L S; then from the ſeveral points on A B draw to L, which will ſeverally cut the upright lines, and thereby determine the ſhadow of each point on the cylinder; ſo that by drawing a curved line, as in the figure, we ſhall obtain what was required.

Observ. 1. The ſhadow of this figure is projected on the ground, and the correſponding letters will point out that part of it which is caſt by the ſquare; and lines drawn from S as tangents to the baſe of the cylinder will produce the ſhadow of that body.

Observ. 2. If the point S was far removed from the ſide of the cylinder, then the ſhaded part of it would be much broader than in this figure; and if S was brought nearer to the cylinder, the ſhadow would be narrower: but in all caſes, the line drawn from S, ſo as to touch the baſe, will determine the breadth of the ſhadow; that is, this point of contact will always be the darkeſt part of the ſhadow. From whence it follows, that theſe kind of ſhadows will appear proportionably broader or narrower, as the rays of light have a greater or leſs degree of obliquity with reſpect to the point of ſight; and that when the light comes upon the picture, from directly before it, then the ſides of the object will receive only a half ſhade, which, on both ſides, will be equal. See the baſe of a column, Fig. 3, Plate XLV.

EXAMPLE XX.

Fig. 2. For the ſhadow of the top of a wall that is placed againſt a cylinder.

1. Take any points 1, 2, 3, 4, on the top of the wall at pleaſure, and draw the upright lines as in the figure.

2. From the correſponding points at the bottom, draw lines to S, cutting the bottom of the cylinder, where mark every interſection with correſponding figures; from thoſe points draw the upright lines upon the cylinder, and continue them at pleaſure; then from the points on the top of the wall draw to L, cutting the upright lines on the cylinder, in the points 1, 2, 3; and then will 1 on the cylinder be the ſhadow of 1 on the top of the wall, &c. Laſtly, through the points 1, 2, 3, draw the curved line as in the figure, which will be the ſhape of the ſhadow, &c.

Observ. 1. The ſhadow of the point 4 on the wall falls within the ſhadow on the cylinder, and therefore it has no repreſentation. The ſhadow of the point 3, falling near the ſhadow of the cylinder, gives that part of the object but a ſmall degree of light, which we expreſs by the term half-ſhadow. The ſhadow of the point 2 marks that part which is the next to the higheſt, or principal light, at the point 1: ſo that from hence we may conceive the gradation of light into ſhade, &c.

Observ. 2. As there is a gradation of light into ſhade, ſo, vice verſa, there is alſo a gradation of ſhade into light. For as I obſerved before, the darkeſt part of the ſhadow will always be above the point A, where the line drawn from S touches the bottom of the cylinder, and it will from hence gradate both ways, viz. on the right hand into light, and on the left hand into what is called a reflexion; all which I have endeavoured to illuſtrate by the finiſhed examples of this kind, and have particularly attended to it in the ſhafts of the columns already produced. Theſe are very uſeful hints for practice,

and

and will moreover confirm what Mr. Hogarth has advanced, in his Analyſis of Beauty, upon light and ſhade; where this very ingenious author has treated this part of ſcience with the ſtricteſt truth, good ſenſe, and perſpicuity.

Observ. 3. If we ſuppoſe the wall to be of different heights, as expreſſed by the lines drawn acroſs it to C, and the ſituation of light to remain the ſame; then the ſhape of the ſhadow, caſt by the top of the wall upon the cylinder, will be varied by every different height. And if a line be drawn from L through C, and then the different ſhades projected, (viz. by the ſame rule as the above example) we ſhall find that all the ſhadows above L B will bend upwards, and all thoſe which are below L B will bend downwards; and they will have a greater or leſs degree of curvature, as they are farther off, or nearer to the line L B. But when the line L B is even with the top of the wall, then the ſhadow will be projected into the direction of L B, and will therefore be a ſtrait line.

E X A M P L E XXI.

Fig. 3. For a ſhadow caſt on the concave part of a cylinder, from any part above it.

1. Suppoſe A B a ſtick over the top: make any number of dots in it, and draw lines from thoſe dots to S, cutting the top of the cylinder; and at thoſe interſections make other dots as in the figure.

2. From the dots on the top of the cylinder draw the upright lines, and then from L draw other lines to the dots on the top of the ſtick; and laſtly, the curved line from a, through c to b, which will give the ſhadow for the ſtick; and ſince b is the ſhadow of B, therefore b d is the ſhadow of B D, &c.

3. For the ſhadow that is caſt on the cylinder by it's own top, viz. the ſpace between 2 and B. For this, draw from any points as 3 4 to S, cutting the top in two other points towards the right hand; then from thoſe laſt points, draw the two upright lines as in the figure, and then draw from 3 and 4 to L, which will cut the upright lines, and thereby give the points for drawing the ſhadow of this part.

E X A M P L E XXII.

Fig. 4. For the ſhadow of a round and horizontal plane, as projected upon a cylinder.

Make points on the under edge, as before; and draw to L, cutting the top of the cylinder; from the points thus obtained, draw the upright lines, and then from L to the points that caſt the ſhadow, which will produce points on the cylinder, and through them the ſhadow is to be drawn, &c.

Observ. If the line D B repreſents a column, then f c is the ſhadow of it.

E X A M P L E XXIII.

Plate XXXVI. Fig. 1. The application of ſome of the foregoing examples.

If the reader turns back the laſt plate, Fig. 2, he will at once recollect almoſt the whole of this operation; and I have repeated it here to ſhew the conformity between the outlines and the finiſhed example. But I ſhall ſhew how to determine the ſhadow within the hollow building. From D to S cuts the bottom in g; draw the perpendicular g e, then a line from E to L will give e for the ſhadow of E; and by joining e f the ſhadow will be compleated.

In the finiſhed figures, I have ſhewn how to repreſent either a ſtone or a brick wall, and have endeavoured at giving each part it's proper tone of light, ſhadow, and reflexion.

Observ. 1. The neareſt edge of the brick-wall, and alſo the neareſt part of the ſhadow in the hollow building, muſt be proportionably darker than thoſe parts of them which are farther off; and for the ſame reaſon that the apparent ſizes of objects are diminiſhed in perſpective in proportion to their diſtance from the eye. In like manner, the bottom of the brick-wall will be of a lighter ſhade than the top of it,

because

becaufe the bottom being nearer to the ground that is enlightened, will receive a greater quantity of reflected light, than thofe parts which are farther from it: but the fhadow in the hollow building will have nearly the fame tone of colour at top and bottom; for being almoft wholly oppofed to other fhadows, it can receive but a fmall degree of reflected light.

Observ. 2. As the colour of fhadow grows fainter and fainter, in proportion to its diftance from the eye, fo on the contrary, the enlightened parts of objects muft be perpetually diminifhed and made darker and darker as they are made to recede from the bottom of the picture. And if a line be drawn from the neareft part of any object that is turned towards the light, to the fpectators eye, it will determine where the higheft or ftrongeft fhould be placed.

Observ. 3. When the object is fo placed as to have one part of it in light, and another part wholly in fhade (like the bottom of the cylinder in the laft example) then the right hand fide of it, which is oppofed to the fhaded wall, muft be darker than the left hand fide of it, which is towards the enlightened wall: and the reafon of this is obvious from what was obferved above. But if both the walls were taken away, and the lower part of the cylinder received a fhadow in this manner from fome diftant object, as a cloud, or the like, then the middle part of the fhadow would be the darkeft, becaufe that is neareft to the eye, and therefore will appear ftronger than thofe parts which are farther off. Of this we have an example in the finifhed figure, Plate XXXVII. From hence we fee the reafon of that well-known rule for the management of fhadows, viz. to make that part of any fhaded object the darkeft, which if placed in the light is the moft ftrongly illuminated. This may be better conceived by refering to the finifhed examples of the mouldings, Plate XLIV.

EXAMPLE XXIII.

For the heights of two fhadows, that are caft by fimilar objects, or by parts which have the fame projection.

Fig. 2. Find the fhadows a and b of the point A, B, as before directed; then through a and b draw the parallels, as in the figure.

Observ. 1. Since the object B is nearer to the vanifhing point L, of the rays of light, than the object A, therefore the fhadow caft by B will not be fo high as the fhadow caft by the object A; for were we to remove B, fo as to be even with L, that is, to be as low as L, then the fhadow would be a ftraight line.

Observ. 2. This method will ferve univerfally for all foffits, and is frequently applied in the foregoing examples.

EXAMPLE XXIV.

For the fhadows of feveral Cylinders, &c.

Plate XXXVII. Fig. 1. Draw lines from S fo as to touch the outfide of the bottom of each cylinder for the breadth of the fhadow; and then we fhall find that the fhadow of the cylinder A falls upon the cylinder B, and the fhadow of the cylinder D will be projected upon the wall. But the board over the cylinders will caft fhadows upon different parts of the figure; which we will now attend to; though this is partly explained already in the 14th example, to which we refer the learner for the manner of drawing the fhadow upon the cylinder B, &c.

The fhadow of the cylinder D is caft upon the wall, and the point 9 fhews the fhadow of its top; and the fhadow of the corner of the board is at the point 8, therefore the line 8 7 is the fhadow of the end of the board, and it is parallel to L V.

Now, fuppofe the cylinder D was taken away; then the cylinder E would receive a fhadow from the foffit, which we determine by our former rule, thus; viz. find the plan of the edge of the board as reprefented at the bottom by the line 4 8, then, from S draw any lines through the bottom of the cylinder

to

to cut the bottom of the board in the points 4, 5, 6; and from theſe points obtain the correſponding points at the top, viz. 4, 5, 6; then draw the upright lines upon the cylinder, and from the upper points 4, 5, 6, draw the top of the cylinder; by which means the curved line may be drawn for the ſhape of the ſhadow, &c.

EXAMPLE XXV.

Fig. 2. This figure contains a particular application of Fig. 9, in plate XXXIV; and all I ſhall add to it is the method for finding the ſhadows caſt by pediments.

First, for the angular pediment.

Let the pediments be conſtructed only of a board, as that is moſt proper for ſhewing the application of the rule, and will be ſufficient for the preſent purpoſe.

From the top d of the pediment, and from any other point a, draw a line to S; then draw the upright line c b, and from a, d draw to L, cutting b c in c; and then is c the ſhadow of the point a; laſtly, from e draw a line parallel to the other ſide of the pediment, which compleats the ſhadow.

Secondly, For the circular pediment.

Take any points on the top of the pediment, and proceed as above; and ſo ſhall we obtain the curved line for the ſhadow; as in the figure.

The two finiſhed examples in this plate, are deſigned as farther illuſtrations of what we have advanced; particularly in the obſervations upon the 23d example.

EXAMPLE XXVI.

Plate XXXVIII. Fig. 1. For a ſhadow that is caſt within a ſquare entrance.

Draw a line from A to S, cutting the bottom B 1 in 1; from 1 draw the upright line, and from D to L will give the point d for the ſhadow of D, therefore join D E, and then is A 1 d the ſhadow of A D; and d E is likewiſe the ſhadow of D E.

Observ. If a perpendicular C K be drawn through C (the vaniſhing point of the ſide 1 E) then a parallel from L (the vaniſhing point of the rays of light) to cut C K in K, will give K for the vaniſhing point of d E.

EXAMPLE XXVII.

Fig. 2. For the ſhadow caſt by the jambs of a door, window, or the like.

Draw a line from A to S, cutting the bottom of the wall in 1; then draw from B to L, which gives b for the ſhadow of B; laſtly, draw the parallel b e.

EXAMPLE XXVIII.

Fig. 3. For the ſhadow of an opening, with an angular top.

From A draw a line to S, cutting the bottom edge in 1, and from 1 draw the upright line; then from B to L will give b for the ſhadow of B; and A 1 b for the ſhadow of A B. Again, through C (the vaniſhing point of the ſide 1 F) draw the perpendicular E M; and through L draw the line L M parallel to the edge E B, whoſe ſhadow is ſought; and where L M cuts C M, will be the vaniſhing point of that ſhadow; therefore from M draw a line through b at pleaſure; and alſo from L draw to E cutting be in e; then is e the ſhadow of E, and e b is the ſhadow of E B. Again, from L draw another line L N parallel to the edge E F (which caſts another ſhadow) cutting C M in N; then is N the ſhadow of F e, therefore draw F e which is the ſhadow of F e.

Here are two finiſhed examples, and likewiſe a nich properly ſhaded.

EXAMPLE XXIX.

Plate XXXIX. Fig. 1. For the ſhadow of another opening, having it's top conſtructed of three parts.

1. From A draw to S, and from 1 the upright line 1 d; then continue the perpendicular C N downwards at pleaſure, and from L draw a line parallel to E D, cutting the perpendicular C N, and this point (which is out of the picture) will be the vaniſhing point of d 2.

2. From L draw a parallel to E D, and from C another line parallel to F G; then the interſection of thoſe two lines will determine the vaniſhing point of the line 2 e; and ſo likewiſe a line drawn from E to L will give e for the ſhadow of E, and conſequently d 2 e is the ſhadow of D E.

3. From L draw L N parallel to F E, cutting C M (the parallel of G F) in M; and then is M the vaniſhing point of the ſhadow e F, which is caſt by the edge E F. ‡

EXAMPLE, XXX.

Fig. 2. For the ſhadow of an arch that falls partly upon itſelf, and partly upon a door, wall, or the like.

1. Take any number of points a, b, d, &c. on the circular part, and beginning at the bottom a or k of the arch, find their ſeats on the line A H by perpendiculars; as in the figure.

2. From A, B, &c. draw to S cutting the bottom of the wall in the points 1, 2, 3, 4, and the ſide of the arch in 5 and 6; then from thoſe points draw upright lines, as before.

3. From a, b, d, on the top, draw lines to L, which will give a, b, d on the door for the ſhadows of a, b, d on the top of the arch; therefore draw the curved line to join the ſide of the arch, as in the figure; and ſo ſhall we have drawn all that part of the ſhadow which is caſt upon the door. Now, ſince the plane which receives the ſhadow, viz. the door is parallel to the front of the arch which projects it, therefore the ſhape of the ſhadow upon the door will be ſimilar to the arch; but the other part of the ſhadow being caſt upon a plane not parallel to that which projects it, will therefore have a degree of curvature, as repreſented by the line which is drawn from g to 6. And in order to obtain this, I muſt firſt ſhew how to determine two perpendicular planes, which I imagine to paſs through the arch, and to interſect each other. The one is F f ſ x 5, whoſe bottom F 5 vaniſhes into S; the other is I i p 4, which vaniſhes into C.

Now ſince all I ſhall advance upon the ſhadows of this kind will be performed by the application of theſe, or ſuch like planes; it is therefore neceſſary for the learner to make himſelf a perfect maſter of this article before he proceeds any farther. And as this is an abſtruſe and very difficult part of projection, and is moreover what has not been conſidered before, a little prolixity in this place will be pardoned by the curious and ingenious reader: but to proceed.

Now if the dotted plane F f f x 5 be once obtained, and the line drawn on the ſide of the arch from 5 (at the bottom) to f on the top of it, then this line will be the ſection which the plane makes with the back part of the arch; and therefore a line drawn from f at the top of the arch, to L the vaniſhing point of the rays of light, will (by the former rules) give the point f (within the arch) for the ſhadow of the point f (on the top of the arch) and by thus obtaining the ſhadows of ſeveral other points, we ſhall have guides for drawing the curved line that is to repreſent the ſhadow. But I have not ſhewn that f ſ o x is a ſection (or nearly ſo) with the top of the arch, and therefore we will now attend to that article only.

1. From

‡ I have not attempted to ſhew how to draw theſe kind of ſhadows, ſo as to ſtand the teſt of a very ſtrict demonſtration; for I am not advancing a ſyſtem of mathematical projection, but only ſuch rules for practice as may enable the artiſt to diſpoſe the light and ſhadow in a picture to a ſufficient degree of exactneſs; or at leaſt for avoiding errors of this kind, ſo frequently to be met with in the works of the beſt maſters.

1. From any point i on the top, draw to C, cutting the inſide of the top of the arch in p.

2. From i and p let fall the perpendiculars to I 4, and draw 1 4 to its vaniſhing point C, cutting F 5 in 7; and from 7 draw the perpendicular 7 o; then is I i p 4 a plane which vaniſhes into C, interſecting the former, or dotted plane in the line 7 o, and conſequently the point o is in the ſection which this latter makes with the former plane; and therefore is one point in the curved line f ſ o x.

3. And by drawing a regular curved line from f through ſ to x, we ſhall have the ſection which was wanted to a ſufficient degree of exactneſs.

If one point, as ſ, ſhould not be thought enough for this purpoſe, more may be obtained in the ſame manner, viz. by drawing other lines between F G and G I to C, and then building planes upon them, like I i p 4; which will give other ſections on the dotted plane, and conſequently more points for drawing the top of the curve, &c. And by proceeding as above, with the lines D 3, G 6, we ſhall likewiſe obtain the points e and g within the arch; and then by drawing the curved line 6 e f g, and continuing it with an even degree of curvature, we ſhall ſee where the light goes off the arch (or where the ſhadow begins) and thereby compleat what was required.

Observ. Here we muſt obſerve, that the dotted plane (which in this and the two following figures we conſider as a plane of rays) muſt be taken on the right hand of the point D, and at a convenient diſtance from it; for were this plane to be taken at D, or on the left hand of D, it would not be of any uſe for the curvilinear part of the ſhadow; becauſe the ſhadow on that ſide of D, &c. are projected upon the flat wall, or door. And I may farther remark, that the ſhadow upon the door may be eaſily determined thus, viz. find the ſhadow a of the point a; then draw the parallel a q, and from the middle of the arch at D draw a line to S, cutting the bottom of the wall in 3; then draw the perpendicular 3 q, cutting a q in q, which will give q for the center, and a q for the radius of the ſhadow a b d 6.

E X A M P L E XXXI.

Fig. 3. For the ſhadow which falls wholly upon the inſide of an arch.

1. Take any number of points on the top of the arch (as in the former example) and find their ſeveral ſeats on the bottom, viz. on the line A H; and from thoſe ſeats draw lines to S, cutting the bottom of the ſide of the arch, as expreſſed by the dots on H 6.

2. Draw lines from the points on the top of the arch to C; and from the dots on H 6 draw the upright lines, cutting the bottom h 7 of the crown of the arch.

3. From the points A, B, D, E, F, G, draw lines to C, interſecting all the lines which were drawn from thoſe points to S, and mark thoſe interſections as in the figure.

4. From the points on A 7 draw upright lines, cutting the lines before drawn from the top of the arch to C, in the points 1, 2, 3, 4, 5, 6; then will theſe figures correſpond with the ſame figures at the bottom, and will all be in the ſame plane; and therefore a curved line drawn through thoſe dots on the top, as in the figure, will compleat the plane A a z 1 2 3 4 5 6 7, which paſſes through, and interſects the ſide of the arch in the line drawn from the bottom at 7 to the top of the arch at a; and conſequently a line drawn from the point a to L, will give a, within the arch for the ſhadow of a, upon the top of it.

5. In the ſame manner proceed with the other lines drawn between A, H to S, till you have obtained all the curved lines, as drawn within the arch; and then other lines drawn from b, c, d, on the top of the arch to L, will give the points b, c, d, within the arch, therefore draw the curve from a to b, which will be the ſhadow of that part of the arch which is contained within the ſpace a b.

6. Draw a line from e to L, which paſſes over, or but juſt touches the curved line within the arch, and therefore the light at this point enters the arch, and conſequently, if the curved line for the ſhadow be regularly continued from d to e, we ſhall have drawn the whole ſhadow.

Observ. If we conſider a a, b b, c c, d d, as chords of ſeveral arches, we may then conceive the manner in which four different planes paſs through, and cut the crown of the arch; and alſo ſee how they are perpetually diminiſhed in proportion to their degree of diſtance from the chord a a of the firſt arch a 7 6, &c. The dotted plane at F, ſhews that no ſhadow can fall from the point f, becauſe a line drawn from f to L cannot paſs through any part of this plane; and it expreſſes alſo (as was obſerved above) a plane of rays.

E X A M P L E XXXII.

Fig. 4. For the ſhadow of a nich caſt within inſelf.

1. Take any points on the top of the nich, and find their ſeats on the bottom line A L as before.

2. With the lines g e, h d, i c, k b, l a (as ſo many given diameters, for finding the perſpective of circles) draw the ſemi-circular horizontal planes, as in the figure; and do the ſame with the correſponding diameters at the bottom: now the perſpective of the ſemi-circles at the bottom of the nich will be the ſeveral plans, or ſeats of the correſponding ſemi-circular planes, which are drawn in the crown or top of the nich; and, if a perpendicular plane whoſe vaniſhing point is S (viz. that which is dotted) be built upon the line F 5, it will cut the above ſemi-circles in the correſponding points 1, 2, 3, 4, 5, both at the bottom and top of the nich, and therefore the curved line from f to 5 will be the ſection, which this dotted plane makes with the crown of the nich, and conſequently a line drawn from f to L, will fall within the dotted plane; and cut the ſection in f, and thereby give f for the ſhadow of f above it.

3. By repeating the operation with perpendicular planes, built on the lines, drawn from G, H, I, K, L, viz. on the left hand of F, we ſhall obtain the other points l, k, i, h, g, for the ſhadows of l, k, i, h, g, on the top of the nich; and therefore a curved line drawn through theſe points to f, will give ſo much of the ſhadow as is projected by the part of the arch between l and f.

4. In like manner a plane built upon the line from E, will give e for the ſhadow of e; and another upon the line from D, will produce the ſhadow of d; and conſequently, the curved line being regularly continued through e and d, will not only compleat the ſhadow, but likewiſe ſhew, or determine the point upon the top of the nich, where the light enters into it; or, if you pleaſe, the beginning of the ſhadow.

Observ. 1. In the two former examples, the ſhadows on the middle of the arches were obtained by the interſections of two perpendicular planes; but in this figure I have determined the points for drawing the ſhadow by one perpendicular plane, and a ſection made with it by horizontal planes.

Observ. 2. The inclination of the ſun for this ſhadow is only 30 degrees; and I have likewiſe added the ſhapes of three other ſhadows, as projected by the nich, when the ſun is at different heights from the horizon; which inclinations are ſpecified on the figure; and when the ſun is in the meridian, and ſo ſituated as to ſhine directly into the middle of the nich, then the ſhadow will be a curved line bending downwards.

Observ. 3. Theſe three laſt examples will point out the errors that have been generally committed in repreſenting the ſhapes of thoſe kind of ſhadows; and a careful obſervance of thoſe things in nature will amply confirm the truth of what I have advanced; and although I have not attempted to demonſtrate theſe projections by mathematical reaſoning, they will, upon a nice examination, be very near to the truth,

and

and may give hints to a curious mathematician for extending this part of ſcience much farther. What I have done is ſufficient for the preſent purpoſe, and an attempt to inveſtigate ſuch curious examples was not unneceſſary in a work of this nature.

E X A M P L E XXXIII.

Plate XL. This plate contains two examples of light and ſhadow; the firſt, when the light comes upon the picture in an oblique direction; the ſecond, when the light comes in parallel to the picture.

The figures A and B are ſchemes for ſhewing how the quantity of light is perpetually varying upon the ſame object; for as the ſun is nearer to or farther from the horizon, the quantity of light that is caſt upon any plane will increaſe or diminiſh in proportion as the rays are more or leſs oblique. Suppoſe at figure A that the rays of light fall upon the object in the direction a 3, b 2, c 1, viz. ſo as to make an angle of 45 degrees with the plane of the horizon; then the line a c being drawn perpendicular to theſe rays will meaſure the quantity of light which falls upon the ſides 1 2, 2 3, of the ſquare A. And the ſame may be ſaid of Fig. B. Now in Fig. A, the rays to each corner 1, 2, 3, fall in ſuch a manner that the middle ray divides the perpendicular into two equal parts; and ſince the line a b receives all the light which can fall upon the ſide 2 3; and the line c b all the light that can fall upon the ſide 1 2, therefore the quantity of light on each ſide will be equal: and were the figure to repreſent any ſolid body, as a cube, or the like, then both ſides of it ſhould be made of an equal degree of brightneſs. But figure B receives a larger quantity of light upon the top 4 5 (as is evident by the ſcheme, and from what has been ſaid above) than upon the ſide 5 6, wherefore the top is more enlightened than the ſide, and therefore muſt be made of a lighter colour.

E X A M P L E XXXIV.

Plate XLI. This plate is deſigned as a farther illuſtration of light and ſhadow, and the correſponding letters to the figures will guide us in the operation; the reader will perceive that I had columns, &c. in my eye, when I deſigned it.

I have now fully conſidered every example of light and ſhadow that ſeemed to be neceſſary, except one part of it, which does not appear to have been taken notice of; and that is, a method for determining the ſhadow of mouldings. Now mouldings have either ſquare, or curvilinear out-lines, viz. like the round mouldings to a column, or elſe ſuch as are terminated by given angles, like a plinth, abacus, &c.

To give a rule for determining the ſhadows of round mouldings, would be attended with ſome degree of difficulty, and we ſhould not acquire any real advantage from it. Beſides, I have ſhewn before how to find the ſhaded ſide of a column, and the direction in which a ſhadow is caſt, either upon a convex, or a concave ſurface. And theſe examples will ſhew how to avoid the miſtakes generally committed by unſkilful artiſts, by giving the ſame kind of direction to the ſhadow of every moulding, whether it be concave or convex. Thoſe falſe repreſentations I have endeavoured to avoid in examples of this kind; and for the truth of this obſervation, I refer the reader to real objects in ſun-ſhine, which will amply confirm what has been ſaid about it.

But I ſhall ſhew how to determine the ſhadows of ſquare mouldings, as the rules for drawing them are clear and ſimple, and as thoſe kinds of mouldings conſtitute the far greater part of architecture. And ſince all that will be ſaid upon this article is wholly deduced from what has been advanced before, I may be taxed with a degree of prolixity, which though neceſſary in my opinion, others perhaps, may think ſhould have been avoided.

EXAMPLE XXXV.

PLATE XLII. Fig. 1. For ſhadows which are caſt by ſquare boards, &c. upon a ſmooth plane, on which they are ſuppoſed to be fixed at right angles.

FROM L draw L C, and from the points I,K draw lines parallel thereto; then if lines are drawn from the corners G, H, &c. to L, they will give the ſhadows i g, &c.

FIG. 2. Here I have ſhaped the boards into the form of a ſection, made perpendicularly through the Tuſcan capital; and having obtained the points f, b, &c. as above, we may from thence, compleat the ſhadow of every part.—The ſame may be ſaid of the third and fourth figures.

EXAMPLE XXXVI.

PLATE XLIII. Fig. 1. For the ſhadows of mouldings caſt upon mouldings, and alſo for determining the height and breadth of the ſhadow upon each particular moulding, which is enlightened.

FIRST, for a capital or cornice.

IN order to have a clear conception of the manner by which theſe ſhadows are produced, I will ſuppoſe that all the mouldings are taken away, except the upper one, which is ſquare; for then this figure will be like figure 3 of plate XLII, and conſequently it's ſhadow is to be found as in that example; and therefore I have nothing more to conſider but the direction of the ſhadow over the ovolo, the fillet and cavetto; and alſo the height of the ſhadow upon the enlightened part of the mouldings.

LET us ſuppoſe that the mouldings are put in their proper places; and the miter joints D G, E F, &c. are expreſſed as in the figure.

NOW the ſhadow of A B, paſſes from B, and is parallel to L C, and from the point c it will tend to C; but in paſſing over the ovolo it will make a curved line upwards; then over the fillet, in a direction parallel to L C; and from g it forms a curve downwards to h; then it paſſes from h to a, in a line parallel to L C.

AND to determine every part of this ſhadow. Firſt, from E (the ſeat of the fillet on the top of the miter joint) draw the parallel E e, cutting the line which is drawn from C to c in the point e; then from e draw a line parallel to L C, cutting the fillet at f, and paſſing over it in the line f g; then is f g that part of the ſhadow which paſſes over the fillet. And a line drawn from the point e parallel to L C, and then another line from L to A, will give a, for the ſhadow of A. And the upright line a d will be a part of the ſhadow of A B.

NOW it might be eaſily ſhewn upon a ſeparate paper, how to obtain the exact ſhape of the ſhadow on the ovolo and cavetto; but I preſume that every perſon's judgment will enable him to perform this part to a ſufficient degree of exactneſs; only he muſt obſerve, that the one turns upwards, and the other downwards, as in the figure; being oblique ſections made by a plane of rays upon curvilinear mouldings, which are placed above the eye of the ſpectator. But if more exactneſs, as to this particular, ſhould be thought neceſſary, the following example will ſupply the defect.

SECONDLY, for a baſe, &c.

DRAW the miter joints M 1, 5 6, and find the ſeats 1, 2, 3, of any number of points, viz. B, D, E, F, G, H, I, K. From 1, 2, 3, draw to C, cutting the miter joint in 5, 6; then draw M S, and find a, the ſhadow of A; then from a, draw to C, and from 3 to S; draw alſo from B to L, which gives b for the ſhadow of B; next draw from a to C, and from D to L, cutting M d in d; then draw from E,

cutting

cutting the line drawn before from 3, and then from this point draw a curved line through d to b, which will expreſs all the ſhadow of the tore that falls upon the ground: but part of this ſhadow is caſt upon the pl nth alſo, therefore draw a perpendicular at e, and from 2 draw to S, cutting the bottom of the plinth, from whence draw another perpendicular, and then lines being drawn from F and G to L, will give f, g for the ſhadow of F, G; ſo that by drawing the curve from f through e, &c. we ſhall obtain this part of the ſhadow alſo. Now all the remaining part of the ſhadow is caſt by the lines G I, I K, K O; and for this, proceed thus, viz. Draw from I to C, and from P the parallel P n; then from L through n to N, and from N draw the perpendicular N 9, which gives 9 for the ſeat of N; then draw from 9 and 1 to S, cutting the parallels which are drawn from 5, o, 6, in the points t, r, s; then from t, r, s, draw upright lines, as in the figure; and if other lines are drawn from I, K, N, to L, their ſeveral interſections, with the upright lines drawn from r, s, t, will give the points i, k, n, for the ſhadows of I, K, N. Again, draw a line from D to R, and then the parallel R x will cut the upright line drawn from t, in x, and thereby give x for that point of ſhadow which falls upon the neareſt part of the tore; viz. upon that part of it which projects even with the plinth; ſo that a curved line, drawn as in the figure, will compleat the ſhadow.

I ſhall now ſhew how to find the heights of the ſhadow, when they are projected upon thoſe mouldings which front the light.

Fig. 1. From any point 1, in the abacus draw to S, cutting the top of the ovolo in 2, and the ſeat of the fillet in 3; then from the top and bottom of the ovolo, viz. 2 and 4, draw the curved line to form the ſection made through the ovolo in the direction 1 S. From L draw to 1, which gives 2 6 for the depth of the ſhadow upon the top of the ovolo: again from L draw a line ſo as to touch the outſide of the bottom of the ovolo in 5, and then the point 5 marks the darkeſt part of the ſhadow, &c.

The ſame may be ſaid of the tore in Fig. 2; for if lines be drawn from L through w, it will be a guide for drawing the depth of the ſhadow upon that part.

EXAMPLE XXXVI.

Plate XLIV. This plate is to ſerve as a farther illuſtration of what I have advanced upon the ſhadows of mouldings, when they are caſt from them upon a ſmooth plane only; and this (after underſtanding the laſt example) will appear extremely eaſy. I ſhall only add an obſervation or two upon what has been ſaid, and then conclude this part of the work.

Observ. 1. The ſhadow of the ovolo (and ſome other mouldings of the like conſtruction) is always lighter at the bottom than at a little diſtance from it; but, nevertheleſs I have, in conformity to general cuſtom, and for the ſake of diſtinctneſs in theſe parts, made the bottom part the darkeſt.

Observ. 2. By attending to the figures in theſe examples, we ſhall ſee the manner by which the light, ſhadow, and reflexion of each particular object is to be managed: and this ſhould be carefully conſidered, and ſo firmly fixed in the memory, as to be ready at hand whenever we attempt to ſhade thoſe parts of architecture; becauſe the neglect of this very eſſential requiſite will make our performances appear as the effects of ignorance or caprice, ſtamp a leſs value upon them, and expoſe us to the cenſure of every judicious obſerver.

BOOK IV.

Of Buildings in general.

BEFORE I begin with this part of perſpective, it will be neceſſary to conſider of the apparent ſize of the trunks of columns that are placed parallel to the plane of the picture.

WHAT I am going to advance, upon this ſingular part of perſpective, is not with any intention to revive a former controverſy about it, but only to offer ſome farther reaſons why columns, that are thus ſituated, ſhould be all drawn of the ſame ſize; and to give an univerſal rule for this purpoſe.

MY continuing of the ſame opinion as formerly, as to this matter, is not owing to obſtinacy, or ſingularity, but becauſe the evidence of my own ſenſes, a candid examination, and the experience of eminent artiſts, have all united to confirm it. And therefore I cannot avoid differing from thoſe ingenious gentlemen, who are pleaſed to conſider this circumſtance in a different light, from that in which I have placed it. Every author ſhould write with candor and impartiality; and though he may not peremptorily determine in diſputable caſes, he may, however, lend his aſſiſting hand towards clearing up that ſide of the queſtion, which beſt agrees with his own opinion. And I have been particularly careful to prevent any objection to the work itſelf on this account; becauſe the ſame rule will anſwer univerſally: and the only real difference will conſiſt in the working with a ſmaller diameter inſtead of a larger.

PLATE XLV. FIG. 2. In this plate I have invented a ſcheme § for obtaining ſuch a diameter to work with in drawing the perſpective repreſentations of columns (that are placed parallel to the plane of the picture) as will occaſion their being all of the ſame ſize; or ſuch an approximate as not to have any obſervable difference, even in columns of a conſiderable magnitude. This is, in my opinion, a material circumſtance, and therefore it is neceſſary to conſider it thoroughly before we proceed to the perſpective of columns that are placed in this manner.

LET A B and D F be the plans of two columns placed upon the line A I; and ſuppoſe E to be an eye, viewing one in its axis E C, and the other in the oblique direction E G.

1. From E draw the lines E A, E B; E D, E F, ſo as to touch the circles †.

2. From E with the radius E C (which is the diſtance of the eye from the picture) deſcribe an arc, cutting the lines E G in g, and the ſide lines in d and f.

3. Through

§ Since the engraving this ſcheme I have been informed that one of the ſame nature has been invented, ſome time ago, by Mr. Wright, an ingenious mathematician; but as I never ſaw, nor received any inſtructions from it, this may therefore be called my own invention, without the imputation of plagiariſm. And the ſame may be ſaid of the diagram, Fig. 1. which will be particularly conſidered by my friend Mr. Cowley, in the next page.

† This method of drawing lines to touch the circles is not mathematically true; but it is nevertheleſs exact enough for this purpoſe, and is eaſier than the true way of drawing lines as tangents to the circles: however I will ſhew how that is to be done alſo.

Biſect the diſtance E C in X; from X, with the radius XC, deſcribe an arc A B, cutting the circle in A B; then from E draw lines to A and B, which will be the tangents required. This is a truth ſo univerſally known as not to require any demonſtration in this place.

3. Through the center G draw the line D F, and through g, the line d f parallel to D F.

4. Through g draw h i parallel to H I; then will h i meaſure (very nearly) the apparent breadth of the column H I to the eye placed at E; and alſo A B is nearly the apparent breadth of the column placed at C; I ſay nearly the apparent breadth, becauſe it is not ſtrictly ſo, as obſerved above.

Now when we look at the circle A B and H I, it is imagined that the eye refers the picture in both caſes to the ſame diſtance; and ſince the circle C is placed in the eye's axis, and by being ſomewhat nearer is larger and more ſtrongly impreſſed, perhaps, upon the retina, than the other circle, which is at a greater diſtance; therefore the eye may take this as a ſtandard to meaſure the diſtance of the other by, and accordingly refer the picture to the ſame diſtance. This ſeems naturally to ariſe from the concluſion we make in our own minds, when we conſider the apparent ſize of the columns that are placed even or parallel with the eye; for in this ſituation I apprehend that they all appear of the ſame height and ſize, though in fact they cannot, ſince thoſe which are fartheſt from the eye muſt be ſeen under a leſs angle, and therefore will be painted in it of a ſmaller ſize than thoſe which are nearer: and this is evident from a b, d f, which are above E, Fig. 1. Now the contray effect to this will be produced if we follow the ſtrict rules of projection; for in this caſe, the farther columns will be larger in proportion as they are farther and farther removed from that column which ſtands right before us. For A B may be conſidered as the projection of the middle column on the picture, and H I as the projection of another column upon it when viewed at a greater diſtance, which will give H I for its projection upon the picture; and by meaſuring H I, we ſhall find it much larger than the projection A B of the column A B, that is nearer by the ſpace G g: and by meaſuring the parallel h i alſo, we ſhall find it an approximate of D F, or A B. From hence I would infer, that this line h i does meaſure (very nearly) the true apparent magnitude of the column D F, and therefore the picture ſhould be referred to that place: for if the ſection h i be made parallel to the H L, it will cut the plane of rays E D F in h i, and therefore h i will very nearly determine the ſize which the column ought to be made of upon the picture; and what will ſtrengthen this opinion, is, that h i is an approximate of A B. †

Those therefore, who will embrace this opinion, and would draw columns thus ſituated, ſo as to make them all of the ſame ſize in perſpective, have this as an univerſal rule for doing it; and thoſe, who ſhall differ in their judgment, and will inſiſt upon making them ſtrictly conſiſtent with mathematical principles, will be referred to a former rule for that purpoſe

CASE I.

For drawing the trunks of columns, which are parallel to the plane of the picture, all of the ſame ſize.

1. Let the axis of the column be determined, as in Fig. 3, one of which is placed directly before the eye.

2. From the center of the picture, draw C I perpendicular to the diſtance C E of the eye.

3. Take the diſtance of the axis of one column from the other, and transfer it from C to G; then take half the given diameter of the middle column, and with it deſcribe the circles from the points C and G.

Z

4 Draw

† Although the line K I is not equal to the line A B, the difference is ſo inconſiderable, that no error nor improper effect can ariſe from conſidering thoſe lines as being equal to each other.

For let us ſuppoſe E C = 6 feet, or 72 inches,
C G = 3 feet, or 36 inches,
A B = F D = 12 inches.

Then by Trigonometry,

$\left.\begin{array}{l} EL = 83,\ 8 \\ EH = 77,\ 8 \end{array}\right\}$ nearly, and E G = 80, 5 nearly, (Euc. 57. 1)

Hence K g = 6, 246,
g I = 5, 8,

Conſequently K I = 12, 046.

But becauſe the fractions were here taken a ſmall matter greater than what they are accurately equal to, the error will be leſs than what is here aſſigned, and therefore leſs than the forty-ſix thouſandth part of an inch; or an inch being divided into five hundred equal parts, the error, or inequality of thoſe lines, does not amount to ſo much as twenty-three of thoſe parts, which may therefore be diſregarded in the applications here made of it.

4. Draw lines from E fo as to touch the circles as in the figure, and alfo through G, the perpendicular D F.

5. With the radius E C (viz. the diftance of the eye) defcribe an arc, cutting E G in g; then through g, draw d f parallel to D F; and then will D F be the diameter for finding the perfpective of the trunk of a column, fituated like D F, which is finifhed in the bafe L of Fig. 3; for here f d is taken equal to f d, of Fig. 2, by which means the apparent width of the bafe L, which is feen obliquely, will be nearly of the fame fize as the bafe of the column A, which directly fronts the eye.

C A S E II.

But if we would draw columns as they are mathematically projected, we muft then proceed by the fame method which was ufed in drawing all the five Orders, in the preceding part of this work. Thus the given diameter a b of the bafe I, is equal to the given diameter a b, of the bafe K; and from this the appearance of the circle is to be determined.

Now, by meafuring thefe three trunks, we fhall find that L and K are of the fame fize; but the trunk I is larger than either of the other, by the width M H; and therefore this may ferve as one inftance of the difproportion, which I apprehend will be unavoidable, if we follow the ftrict mathematical rules of perfpective, upon this occafion: but this will be much more evident, by the column D, on plate XLVII, which is drawn by a proper diftance, and is, I believe, as difagreeable a form as can well be produced, being no more than five diameters and 3-4ths high, and which would have been the fhape of the column B, for it is made to anfwer for that place. As to the difference, which may be occafioned by a too great projection of the bafes to the fide columns, when drawn by this leffer diameter; little or no objection can I apprehend arife on this account, fince they will not have an unnatural appearance; and for this I appeal to the finifhed bafe, which is under Fig. L: and, that I might be as fair and candid as poffible, I have given the bafes under L and I the fame kind of light and fhadow, by which means, a more exact determination may be made.

That I might cut off all occafion for controverfy, thefe two methods are offered for drawing the trunks of columns; and I would not, on any account, peremptorily obtrude my own opinion upon others, but only offer my real fentiments in a difputable cafe: and I here declare alfo, that I fhall not think myfelf obliged to give an anfwer to any remarks which may be made, upon what is here advanced: the opinion of candid and fenfible perfons will be thankfully attended to; but the ftrictures of fnarling and malevolent critics will be entirely difregarded.

Plate XLVI. Fig. 1. For a Tufcan colonnade.

Give A for the center of the corner column, and through it draw the parallel line B F; then from A, fet off the intercolumniation A B, of two columns in the front; and A E, E F, for the two columns on the fide. Draw the axis A Z, and B D; then upon the axis A Z and B D, fet off the heights and projections of the principal parts of the Order, as is expreffed by fhading in the figure. Now draw A C, then from L to E and F, which will obtain the centers G and I of the fide columns, therefore draw their axis alfo as G H, I K,; and then lines drawn from the axis A Z to C, will give the feveral heights as in the figure. And in the fame manner, the projections are to be found alfo, viz. by drawing the projection on A Z to C, as is fhewn by the plinth and abacus.

Now for adjufting the fize of the trunks of columns. Any where apart, take (for want of more room) half the given diftance C L, and transfer it to E C; and from C draw a perpendicular at pleafure; then take half the diftance of the column 1 from the center C (Fig. 1.) and transfer it from C to 1 (Fig. 2.)

do

do the ſame by the column 2; and then draw lines from 1 and 2 to E (Fig. 2.) through 1 and 2, draw the perpendiculars a b, c d, and taking 1 and 2 for the axis, make a b, and c d, each equal to half the given diameter of the trunk, both at the top and bottom, and draw lines to E; then with the radius E C deſcribe an arc, cutting E 1 in n, and E 2 in m; then proceed as directed in 44, 45, and ſo will f e be half the diameter for producing the column 1; and h g will be half the diameter for the column 2.

In like manner, we may obtain the diameters for the two ſide columns; thus, take half the diameter of the column 3 in the compaſſes; then lay a parallel ruler to a b or f e, and move one ſide of it till the half diameter in the compaſſes coincides with the lines drawn from a and b to E; then at that place draw o p parallel to f e, which will give the diameter required; and the ſame may be ſaid of the column 4, &c.

The next thing is the entablature; and for this, the method in the jeſuit's perſpective correſponds exactly with my general rule for ſquare mouldings.

And firſt for the top of the cornice: from L through the given height Z draw the line Z M at pleaſure; then from C (through the given projection L) draw a line cutting Z M in M, and ſo will M be one corner. Again, draw a line from the center C, through the other projection P, on the left hand; and then it's interſection by the parallel MQ, will give the other corner of the cornice, and conſequently the utmoſt width of it. The ſame thing repeated for the frieze and architrave, or for each individual moulding, will obtain the projections of thoſe parts alſo; thus from a, we obtain the point e, for the bottom of the fillet; and from R the point S for the top of the frieze, or bottom of the cornice, &c.

Having determined the projections of the members in front, thoſe on the ſide may be eaſily found alſo; thus from the top and bottom of the cornice, draw lines to C; then ſet off the other point of diſtance to the right hand (which would not come into the picture) and from that point draw to the heights marked with aſteriſks on N K, which, cutting the lines that are drawn to C, will give the projections as in the figure; thus O W is the cornice, &c.

Having thus determined all the principal parts, the others may be drawn by the rules which were made uſe of in ſingle columns; and more, or fewer lines may be made uſe of, as the artiſt ſhall think it neceſſary, to be more or leſs exact.

In many caſes a ſmall number of lines will be found to anſwer the purpoſe, eſpecially to a perſon who is tolerably ſkilled in drawing.

Here I am aware of an objection which may be made, on account of the extraordinary projections of both the upper and lower cincture, which will neceſſarily follow, from working with a leſs, inſtead of the real diameter of the column; but he muſt have a bad hand indeed, who cannot adjuſt the drawing by his eye, ſo as to give it an eaſy or natural appearance.

If the rule I have given for finding the diameter, ſhould be attended with any trouble or inconvenience, for want of room upon the picture, it may be done by a ſmall ſcale upon paper, which will anſwer the ſame purpoſe: or if the artiſt ſhall chuſe to proportion the ſize of the trunks of columns to their given heights, his eye will direct how they are to be placed, ſo as to correſpond with the baſes and capitals.

N. B. It is abſolutely neceſſary for the learner to underſtand this example thoroughly before he proceeds any farther; and to make it as familiar to him as poſſible, I will here ſet down the regular proceſs, viz. Firſt, give the center of one column. Secondly, give the intercolumniation of the two neareſt columns,

and draw their axis; then upon the axis of column 1, set off the greater heights and projections from the bottom to the top: do the same by the other corner of the entablature. Thirdly, find the center, and draw the axis of the side columns; then transfer (from the corner column 1) the several heights and projections. Fourthly, adjust the size of each column by Fig. 2, and draw the trunks. Fifthly, find the general projections of the entablature. Sixthly, draw all the mouldings, and finish the figure as on plate XLVII.

Before I proceed any farther, let us examine how far the rules made use of in the preceding part of this work, and particularly those for drawing this order at large, have been applied in this example.

In the first place, the centers for all the columns have been determined by rule 1 and 2 of plate I.

Secondly, the squares for the bases and abacus of the capitals, were obtained by the method of putting a square into perspective from a given diameter, as in Fig. 5. plate 2. which does likewise for all square mouldings; as hath been shewn by the rule for that purpose throughout every order, viz. plate IX.

Thirdly, all the circular mouldings may be drawn by repeating the rule contained in plate IV. Fig. 10. and by the rule calculated for this purpose, plate X.

Fourthly, the entablature is produced in the same manner as the entablatures to all the orders, with this difference only, that in the orders it is made perfectly square, as united to one column only; but in this example it is continued, so as to be suited to more columns than one.

Now if all this be perfectly understood, it will greatly facilitate the succeeding operations.

For a Doric Colonnade, like that on Plate L.

Plate XLVIII. Before we begin with this colonnade, let us consider the principal requisites which are wanted, and particularly those which have not been applied in the last example.

In the first place, we want the centers and axis of all the columns, their principal heights and projections: all which has been done in the last example.

Secondly, we want the returns of the entablature, the breadths of the triglyphs and motops; and for this purpose we must be careful to give a proper intercolumniation to each part, that the distance of the columns may be suited to the quantity of their ornaments. And having given all the proper intercolumniations, the triglyphs, &c are found by the same rule as was used for determining dentals, modilions, or the like.

After these observations, it appears almost needless to be very particular in shewing how to draw every part of the following figure; yet to make myself as intelligible as possible, and to fix what has been said the more strongly in the memory of my reader, I will carry him through this figure step by step till we have wholly compleated it.

The parts that are ruled, express all the general heights and projections that are wanted.

Let A L be a line for the axis of the nearest columns A and C, the centers of the two nearest columns A C and the intercolumniations adjusted for two triglyphs and an half; C Z another intercolumniation for three triglyphs and an half; I K the intercolumniation for four triglyphs; and K L the intercolumniation for the end, which is to contain four triglyphs.

Draw a line from C, and another from Z to L, which gives D for the axis of one column; therefore draw the parallel B M, and then from A, I, K, to cut it in B, E, G, M, then are B, E, G, the centers of three columns more; therefore draw the axis of these also, and from the column C P, transfer the heights and projections to the axis D S; then transfer the heights and projections from D S to the columns at B, D, E and G, from whence the columns B, D, E, G may be drawn; for having the heights and diameters

of one column given, we can from thence (or from the ſector, or from another ſcale) take off the ſeveral parts; and the quantity to be taken from each of theſe columns, by their being joined to the buildings, is determined by the lines B E and E F, which being in the axis of the column, takes away one half of each column. See the finiſhed example in plate L, and alſo Fig. A, B, of plate LI.

Now for the columns at F and H. From M draw to L, which obtains H, and the parallel H F obtains F; therefore draw the axis from H and F, and find (as before) their heights and projections.

We now come to the entablatures. Here, the firſt or neareſt part, is found as in the Tuſcan colonnade; and becauſe the miter-joint at S T is parallel to that at P Q. therefore they will both vaniſh into the point L; conſequently, if lines are drawn from L, through the points on the axis, as S, P, they will cut the lines drawn from the neareſt corner to C, and therby give the joining of the mouldings at Q T. Again, for another corner X; draw from L through the axis V, and from C through the projection W, which gives X for the corner wanted. And from the top of the axis Z, to the diſtance H (which is out of the picture) will obtain the corner Y, &c.

Thus have I ſhewn how to find columns in various ſituations, whether they are to appear as whole columns, or only as half ones. And likewiſe how to determine the miter-joints, or angles of an entablature, all which is performed at once in the very place where every part of the building is to ſtand, and without making uſe either of a plan or elevation, but only the ſimple rule of cutting off a line that vaniſhes into the center of the picture, by means of one of the points of diſtance; as I explained by Fig. 2, plate I, &c. In the ſame manner every particular moulding may be drawn.

But it now remains for me to determine the perſpective of the triglyphs, metops, &c. and for this I will continue the axis of the firſt column A,C at pleaſure, above the cornice; and then draw the parallel a b; then upon the line a b place the triglyphs and metops in their regular order, beginning at the axis c, d of each column; then continue the axis of the other columns upwards, viz. D, E, G; draw from c to C, and the line e i. Again, from L draw through c, and from C through a, which gives the corner g for the angle of the frieze: then draw the parallel g f, and from C, through the points on a b, will give f for the other end of the frieze, and likewiſe the width for all the triglyphs and metops, which is more fully explained in Fig. 1, plate XLIX.

In like manner, lines drawn from C to o, and from the points on the line a b (which meaſure two triglyphs and a half, for the return of the ſide g h) will cut the diagonal g n, and ſo give the breadths of thoſe parts. Again, for the other triglyphs; from a b, transfer the ſpaces, &c. to the line e i, (viz. the line that is upon the axis of the columns at D, E, G) and then proceed as above directed, which will not only determine the triglyphs at the ends of the frieze, but thoſe alſo which are between p and m, &c.

Now again let the reader refer to the rules for drawing the Doric ſoffit, or thoſe for dentals, modilions, &c. and he will find this to be the very ſame in every reſpect.

Plate XLIX. Fig. 1. In this plate I have transferred the meaſures which were obtained before for the modilions and metops; and I have ſhewn how to draw them upon the frieze, by means of perpendiculars, which were expreſſed by dotted lines, &c.

The angles for the inſide of the architrave at s, is found by drawing from L through the top of the axis of the column, to cut the bottom of the architrave as in the figure.

As to the niches, I need only refer the reader to that in plate XXXVIII and XXXIX, which ſhews this to be only the perſpective of half a circle.

In the two following examples I have ſhewn how to find all the joinings of the cornices, which will be wanted in this work: but it may be neceſſary ſometimes to have a perpendicular ſection, and therefore I will ſhew how to find that alſo.

Fig. 2. From the center of the picture draw lines through e, h, k, viz. through the axis e k; then from L, through the points d, g, i, which ſeverally meaſure the real projections, will obtain what was required.

EXAMPLE I.

Plate LI. Fig. 1, For pilaſters; and any part of a column.

Give A and B for the middle of the pilaſters, and let the firſt (at A) be 1-4th as thick as 'tis wide; the ſecond at B, half its width.

Set off the heights and projections upon the lines A F, B G, and continue thoſe lines both above and below the figure. Now I will firſt determine the thickneſs of each pilaſter below A, B, and then the greateſt projection of the cornice; which will be ſufficient for ſhewing how all the other parts are to be produced, viz. only by repeating the ſame rules.

1. For the thickneſs of the pilaſter at A, which is to be 1-4th of its width. Divide half the given width 1, 2, into two equal parts; then through 1 and 3 draw lines from C, and from L draw through 4, which gives the thickneſs; and a parallel from thence will determine the breadth of the front.

2. For a pilaſter which is to be half as thick as it is wide. Draw from C, as before, through 5 and 6; from L through 7, and then a parallel for the front of the pilaſter.

3. For the projections above. Continue the thickneſs of the pilaſter to the top of the entablature, and then from the projection b of the cornice, draw a line from the center C; do the ſame through a, to e; then is a e the ſide of the pilaſter where the top of the cornice repreſents the miter joints cutting the ſide of the cornice in the line c d, which will be the thickneſs of it in that place: a parallel drawn from e will repreſent the top of the pilaſter in front; and for the top d g, d c of the cornice, from C through b, a, f, and from L through a, G, will obtain theſe parts alſo; and ſo of the other parts, which will be much better comprehended by drawing the figure at large, than by any explanation: and the operation being repeated above, will help to explain my meaning more fully.

As to the pilaſter on the ſide, whoſe front tends to C; the breadth and thickneſs of that is obtained by lines drawn from the other points of diſtance, to the corners of thoſe which are in front: thus from k to H give the point, &c.

EXAMPLE II.

For parts of columns, viz. an half column, and a three quarters column, in front, and at an angle.

1. For an half column, Fig. A. Give a b for the diameter, and from it draw the perſpective of the loweſt half of a circle.

2. For a three quarter column in front. From the diameter a b find the perſpective of a whole circle; divide one half of the diameter, viz. c b in d, and cut off c h to repreſent c d, then draw the parallel e f.

3. For a three quarter column at an angle, Fig. B. From the given diameter a b, draw the repreſentation of a circle; and omitting 1-4th of it, as b c d, we ſhall have what was required.

EXAMPLE III.

Plate LII. Fig. 1. For pilaſters, or ſuch like projections.

Here a b is the width of the wall, and e g, and s t, are the given projections. From C and L will give the ſeveral corners n, o, p, q, r, *, u, w, of the pilaſter, &c. in front. And for thoſe on the ſide,

which

which are to correfpond with them. Continue parallels from the top and bottom, as in the figure, then from c and a draw lines to C, &c. and then lines from H (as f q) to the feveral parts of the pilafters, &c. will give the correfponding parts for the fides, &c.

UNDER the out-line is a finifhed example, with the light falling upon the angle.

FIG. 2. Having drawn the trunks of columns, to find the apparent breadths of the flutes.

LET A, B, D be three plain cylinders: at any convenient diftance, draw K M parallel to the horizontal line, and from the centers 1, 2, 3 of the cylinders, perpendiculars to cut it in F, G, h; through C the center of the picture, draw E K perpendicular to K M, and make K E equal to the diftance C H: then draw lines from E to F, G, h. At F, G, h, defcribe circles, whofe diameters are refpectively equal to the three columns; (and which may be confidered as the plans of them) and from E draw lines to touch the circles, as in the figure; then draw as many flutes to each plan as can be feen within the lines drawn from the eye. Now take the width of the cylinder A in your compaffes, and move a ruler parallel to K M, till the fpace a b coincides with the compaffes; then from the feveral flutes on the plan draw lines ending to the eye E, which will divide a b, and thereby give the apparent width of as many flutes as can be feen upon the column A. In the fame manner find thofe of the other cylinders, &c. Thus fhall we obtain, to a fufficient exactnefs and in the moft eafy manner, an effential part of a column; which, to acquire by any other method, would exceed the utmoft degree of human patience.

N. B. When the diftance, &c. happens to be too great to be readily brought into the picture, then taking 1-half, 1-3d, &c. of the objects, and 1-3d of their diftance from the middle of the picture, viz. from the line E C; and ufing 1-half or 1-3d of the diftance of the eye, will produce the fame thing.

PLATE LIII. Fig. 2. For Arches and plain Pediments.

1. Draw the front of the arch, and alfo the parallelogram, with lines in it to interfect the arch, as in the figure.

2. From the front already drawn, draw the oblique fide, where the correfponding letters and figure fhew how to determine the points for drawing the arch, &c.

3. In the fame manner find the depth of the infide of the front arch; then the parallel p q will give the fide of the other: the parallel R S, and a line from F to C, will give S for the center, and S R for the radius of the back part of the arch.

4. For the pediments: Draw the parallel N e, and then a line from e to C will interfect f n, and thereby give n for the top of the fide pediment; the parallel n M, interfected by N C, will determine the top and joining of the roof, &c.

BUT the pediments being conftituted of inclined planes, I might in this place fhew how to find the vanifhing lines and vanifhing points of them; but this would carry me into too large a field, without anfwering any real purpofe: however I may juft obferve, that if a perpendicular be drawn through C (the vanifhing point of the oblique fide) and lines drawn from L (viz. the point of diftance) parallel to the fides N O and N d of the pediment in front, fo as to cut the line drawn through C in V and W, then V and W will be the vanifhing points of thefe pediments.

FOR any thing further relating to the doctrine of inclined planes, I muft refer the reader to my former work, where this part of perfpective is particularly explained.

THE fecond figure is drawn to one half of the fize of Fig. 1, and is defigned as an example of light and fhadow. And the pediment above it is given as a hint for drawing the mouldings; but this may be paffed over till we come to plate LXV.

PLATE LIV. For an arch with three-quarter columns placed on pedeſtals.

THE manner of drawing plain arches may be eaſily conceived from the laſt figure; but I will now ſhew, in the firſt place, how to divide the inſide of an arch into any number of pannels, for ornaments, &c. and this admits of two caſes; firſt, when the view is taken in the middle of the arch; and ſecondly, when it is ſeen ſide-ways.

CASE I.

When viewed in the middle, as in the figure.

1. Divide the front into the proper parts for the pannels, &c. and from thence draw lines to C.

2. Let r 9 expreſs the real depth of the arch; and divide this line into the parts for the widths of the pannels, &c. then lines drawn from the points on r 9, to the point of diſtance, will cut r s in the perſpective breadths, as r v.

3. From v draw the parallel v w, then w is the center, and w v the radius for deſcribing one pannel, and ſo on.

CASE II.

FIG. B. When the eye is placed on one ſide of the arch.

1. Here a b is the width of the arch: divide the top of the arch as before, and draw lines to C.

2. From b draw a line to the point of diſtance, cutting off a e to repreſent a b; do the ſame for the pannels, &c. that are marked on a b, as c, which will obtain the points for the breadths of the pannels on the line a e, as e g.

3. From o draw to C; and from g the parallel g k; then is k the center, and k g the radius for drawing one pannel as before.

I WILL now ſhew how to delineate the other parts of this figure.

THE moſt material parts ſhall be put under two diſtinct heads, and then I will conſider each part in its regular order.

Firſt, I muſt determine the perſpective of four three-quarter columns with pedeſtals, and the projections as given in the plan A.

Secondly, The impoſts, and their joinings to the column.

FIRST, for the columns.

1. Give the line A F, and thereon place the centers of the columns, as A, D, E, F; and alſo the middle of the arch at H.

2. On A B put the heights and projections, and from thence finiſh the three-quarter columns, as ſhewn in plate LV.

3. Take from Fig. A the ſeveral projections 1, 4, 5, 6, 7, and transfer them from E to 7; and then draw a line from C through each point; and then a line, from the point of diſtance (to the right hand) through E, will give one corner z of the plinth.

4. From the plinth of the column at x, let fall a perpendicular x n, cutting the line drawn from C to 4 (viz. the projection of the plinth) then from the above point of diſtance draw through n, which will give the angle at y.

5. From y draw a parallel, then from the point of diſtance draw through s, which gives the corner 7, &c.

6. From the points thus obtained, we may finiſh the plinth; and ſo have a ſufficient guide for compleating the mouldings.

Secondly,

Secondly, for the impofts, &c.

Upon any axis, fuppofe A B, fet the heights and projections of the impofts at b d e; then take the diftance 1 2 (Fig. A) which is the diftance of the wall from the axis of the columns, and fet it from A to a; then obtain the point 1, from thence draw a perpendicular 1 k, and on it transfer the utmoft heights and projections of the impofts, from thofe which are given at b d e, and fo fhall we obtain the total height and projection of the impofts, which will enable us to draw them correctly in their proper places, viz. at 9 and r.

Now to join the impofts to the columns; place the height of impofts on the axis of the column, viz. at K; and with the diameter in that place draw the perfpective of a circle; then the top of the impoft being drawn to cut this curve, as at M, will be the joining at that place, &c.

Plate LV. By this print I have endeavoured to teftify my efteem for the memory of Dr. Brook Taylor, and had my abilities been equal to my inclinations, I would have produced fomething more fuitable to the character of fo eminent a man; who may be confidered as the parent of perfpective.

Plate LVI. For a plain houfe.

1. Give b d for the bottom of one fide, and anywhere under it, draw A E, to which let fall the perpendiculars b B, d D.

2. Upon A E place the widths for the windows, and on d k put their heights, and alfo the height for the cornice; and from hence draw the windows and cornice in front.

3. From A B obtain the windows, &c. on the end of the houfe b e.

4. From C draw through D, then from H through E, &c.

5. Lines drawn from C through the divifions on D E, will give the breadths of the windows on F G, that are on the front fide f g.

6. The lines at 1 2 and 3 4, fhew how the jambs of the windows are to be obtained.

But in this example it is the roof and chimney that particularly require explanation. For drawing thefe, continue all the fides of the building upwards as in the figure; then draw the parallel A B, and from B draw to C, cutting d k produced in G; from G draw the parallel G K, and then from K to C, and fo fhall we have the feveral lengths of the bottom of the roof.

Now for the top of the roof.

1. Continue A B at pleafure, and draw from H through G to F; which will give B F for the real length of the fide B G.

2. Bifect A B, and draw from D to C, cutting G 1 in 2; then will 2 determine the corner of the roof at t.

3. Do the fame by K M, which will give O for the corner p of the roof, if it was upright at the end, like l p n.

4. For finding the hips of the roof; give B E and K S for the depth of the hips; then, in this cafe, C directs the fituation of the hip v, and 3 the fituation of the hip at S, therefore let fall perpendiculars from r and 3.

5. Set the height of the roof from l to q, and draw q p to C, then is p the height of the roof in that place; therefore from p draw a parallel to cut 2 t; from C draw through t, to cut c v in v; then draw the fide of the roof, as in the figure.

In the ſame manner, I find the perſpective of the chimneys; for which purpoſe all the lines and points are drawn that were neceſſary for doing it.

Plate LVII. Here the houſe, which was explained in the laſt example, is compleated.

Plate LVIII. For ſtairs.

Since theſe are parts of architecture, particularly adapted to houſes, I have therefore given them this place in the work.

Fig. 1. Give A B for the length of the ſtairs, at the bottom of the building, to which I ſuppoſe the ſtairs are placed; and B 4, 4 5, 5 D for the heights of three ſteps; alſo B 1, 1 2, 2 3, for the widths of three ſteps; and the operation is evident from the figure.

Fig. 2. Give B E D for the ends of three ſteps, and A B for the lengths, &c.

Fig. 3. Give I O for the bottom of a building; I G, G F, &c. for the heights and widths of the ſteps. Through the ſeveral corners draw from C at pleaſure; then make B 1 equal to F G, and by means of the point of diſtance L, &c. find the ſeveral parts as in the figure.

Fig. 4. Here I ſuppoſe a b is the bottom of the building, &c. and it is alſo given for the projection of the part D from the building; and the other part A is to be exactly ſimilar to it; which together make a flight of two ſteps.

Draw from L through a, from C through b; then from c the parallel c d, which gives the projection of the part D. Again, draw from L through d, from C through c, and then the parallel e f will give the projection of the part A, &c.

Fig. 5. For three flights of ſteps. Conſider A B as the bottom of the building; a 1 as the width of one ſtep; A 2 as the projection of the middle flight. Now, draw lines from L and C through 1 and A, which gives the corner e; therefore draw the parallel e g. Again, from C draw through e, 1, ., at pleaſure; then from L through e determines the projection of the ſecond flight, viz. g h. Now draw the parallel h i, then from L through i gives the projection of the flight F, &c.

Plate LIX. The manner of drawing this building muſt be obvious, from the example in plate LVI; for 1 2 is given for the bottom of the building, and the ſeveral heights are ſet off upon the line 1 4. By the line B D we obtain all the widths, and by 1 4 the ſeveral heights, &c. G H for drawing the roof; and becauſe the whole width of the roof, which tends to C, would be extended farther than the compaſs of the plate; I have therefore taken one half it, and likewiſe one half of the diſtance C L (viz. C K) which anſwers the ſame purpoſe.

Plate LX. Contains a finiſhed example of the laſt figure.

For drawing the banquetting-houſe at Whitehall, which was built by Inigo Jones, for part of a Royal Palace.

Plate LXI. Fig. Z, is as much of the elevation as is wanted, which being ſo ſmall, I have therefore not given any part of the plan; for the ſeveral general projections may be ſufficiently comprehended from the perſpective of the parts, as is expreſſed above, and below the building.

Upon the lower line A D is ſet off the ſeveral widths and projections, viz, for the windows the axis of each column and pilaſter, the baſes of the columns and pilaſters, and of the middle of the projection in front; all which being regularly reduced into perſpective, will give ſufficient guides for drawing as far as the top of the trunks of the lower columns, &c. and in the ſame manner find the entablature over them, which will be eaſily underſtood from what follows, viz. the manner of drawing the upper part of the building.

building. For this, draw three parallel lines at pleafure, viz. E F, G I, K M, and draw perpendiculars through them for the axis of the columns, &c. From thefe axis fet off the feveral projections and find the perfpective of them as in the figure; and fo fhall we obtain the general projections of each part, from whence the whole drawing may be compleated.

Plate LXII. And here we have a finifhed example, of a fmall part of that moft magnificent ftructure, which was defigned by a native of this kingdom, as a Palace for the Kings of Great Britain, and which, were it ever to be carried into execution would be a ftriking proof of the great abilities of the architect, and of the refined dignity of a Britifh Monarch.

Plate LXIII. For a houfe with a colonnade, &c.

If the reader recollects what he has done before in plate LVI, he will readily draw all the building except the triglyphs, the columns, and the arch; and to bring the method of working that example more eafily to his mind, I have given the places for the windows on the line A E, &c.

And for the columns, we are to proceed as in the laft example, viz. by fetting the points marked c, for their axis on the given line A E, &c.

For the triglyphs.

Those in front are readily drawn, and for thofe on the oblique fides, continue lines up at pleafure as in the figure; then find the length of 3 5, and give the fpaces for the triglyphs and metops, and then find the feveral perfpective breadths on 3 4, &c.

Above (on the left hand) I have found the roof and chimney, by a method fomewhat different from that in plate LVI and LIX. Continue up the fides of the building, and draw A B, B G; and alfo B E; give g for the center of the chimney, h k for the width, g i for it's height, and E l for the inclination of the hip of the roof. Upon A B, is likewife placed the point a, for the top of the roof, and for the middle of the chimney alfo; a b is the height of the roof; from e cuts off c for the corner of the hip, &c. c d is it's perfpective height. The height of the chimney is m n, which may be obtained either from g i, or a b; for I have put two ways for finding the chimney, viz. one upon the line B E, and another upon the line B A.

Plate LXIV. This plate exhibits a finifhed print of the laft example; the Defign was made, and compleated for me, fo as to come within the compafs of the plate: and I hope I may take the liberty of faying, that This, and the laft finifhed Print in the book, are efteemed by me as the moft valuable parts of it.

These examples of four houfes only, are, I apprehend, fufficient for the generality of buildings; for the ingenious architect will perceive, that they are calculated for drawing a variety of objects; whofe perfpective appearances may be truly obtained by fome one, or more of the general rules; and any one may readily find by practice, how to apply them univerfally.

But there now remains fome particular parts of buildings, which feem neceffary to be confidered in this place; I mean the angular and circular pediments; thefe are curious examples, that I do not remember ever to have met with, though they are very ufeful, and therefore ought to be attended to.

Plate LXV. Fig. 1, For an angular pediment.

Having drawn the body of the building, and determined the mouldings of the cornices, as if no pediments were to be placed over them; we muft, for the pediments, proceed as follows, viz.

First, for the pediment in front.

Find the perpendicular ſection made in the middle of the cornice, as e f d, which will determine the ſhapes of the mouldings in that place; and ſince thoſe at the top of the pediment have exactly the ſame projection (that is, are all even with the mouldings below) they will limit the projection of each moulding at the angle of the pediment: but ſince the line l n, which is the height of the angle of the pediment, is longer than the line d f, which is the real height of the cornice, therefore the heights of the ſeveral mouldings on l n, will be greater than thoſe on f d; but in both caſes, the lines drawn from C through the ſeveral points on f d, on l n, will, with the aforeſaid perpendiculars, determine the perſpective of ſuch ſections, and conſequently the ſhape of each moulding in it's proper place. So that all which is wanted, is a method for finding the heights on l n; and this is obtained by drawing a perpendicular g k, within the given height for the cornice, upon that ſetting the ſeveral mouldings, and then drawing the parallels to cut off l n, as in the figure.

Secondly, For the pediment on the oblique ſide.

Set the heights and projections upon c s; then determine the plane o p q in the middle, and from thence draw lines both ways to the ends of the cornice, as in the figure: or the mouldings may be drawn thus, viz. having found the plane o p q, draw a perpendicular through C; then draw a line through F q, and another through G q, cutting the perpendicular drawn through C; and then thoſe points (as N) are the vaniſhing points of the mouldings; which may be more clearly comprehended by the ſecond figure.

Plate LXVI. Fig. 1. For a circular pediment.

First, For the front ſide.

Determine the planes l n m, and t r s, as in the laſt example; and let 1 be the center for deſcribing the circular mouldings in front, I mean as an elevation only. From C draw a line through the center 1, and let fall perpendiculars from the ſeveral mouldings of the plane l n m; then will 1, 2, 3, 4, 5, 6, be the ſeveral centers of the mouldings in perſpective; thus 6 is the center, and 6 m is the radius for the upper fillet, &c.

Secondly, For the pediment over the oblique ſide.

From the corner G of the upper fillet draw the perpendicular G d; then take any number of points, as F, E, &c. on the top of the pediment in front, and draw parallel lines to cut G d in o and d; from o and d draw to C; and from F, E, &c. other lines to the point of diſtance; which will give the correſponding points f, e, &c. on the oblique ſide; through which points if we draw a curved line as in the figure, we ſhall obtain the true ſhape of the top of this pediment alſo; then by means of this and the plane r s t, we may compleat all the mouldings neatly by hand; and the projections of the cornice will be guides alſo.

Fig. 2. A general rule for drawing conſoles and key-ſtones.

Give the elevation, as A B, and draw lines at pleaſure for the projections, as E F; then take the ſeveral heights and projections, and reduce them into perſpective, in their proper places, as in the annexed figure; and ſo ſhall we determine the true ſhapes of thoſe parts.

Plate LXVII. Here is the former example of a door finiſhed.

Plate LXVIII. For columns that are placed in a circular manner.

Let Fig. 1 be a plan of one quarter of the intended deſign, viz. of eight columns to a round building; which is to be viewed by the eye directly in the middle of the building.

Draw

Draw a b for the diameter of the middle of the building; fix the center A, and draw the axis A B, upon which ſet the ſeveral heights as they are wanted; which will be a ſcale for the other parts. Upon A b ſet off the ſeveral projections (Fig. 1.) as 3, 4, 5, 6, both ways, and from theſe diameters find the perſpective of four concentric circles, as in the figure; then will g be the center for the axis of one column; 6 another, and n another. Again, take (from Fig. 1) the length 1 2, and ſet from A (Fig. 2) to 4; then draw a line from C through 4, cutting one of the middle circles in d, m; then are d, m, the centers for the axis of two other columns. Now for the diameters of the columns; the line 5 7 is one diameter; therefore take the half of 5 7 and ſet from A and 4 to 2 and 3, then draw from C through theſe points, which will give d e, f g, for half a diameter in thoſe places. And having thus obtained the heights and diameters to work with, the next thing is to compleat the out-lines of all the columns, as in Fig. 3.

I am next to ſhew an univerſal method for determining the ſtraight mouldings to columns thus ſituated; and ſince two ſides of them are generally made to tend to the center of the building, therefore theſe parts may be obtained as follows, viz. Draw a circle equal to the middle diameter of ſuch mouldings, like a b of Fig. 1; then from the center A (Fig. 2) draw lines to touch the repreſentations of thoſe circles, like thoſe in the figure; and this will give the apparent breadths of the mouldings, which I have expreſſed in the figure, by ſhading thoſe parts.

But I would obſerve that there is no neceſſity for repeating this operation for every moulding, ſince a few principal parts will be ſufficient for drawing the whole; and a little attention, improved by practice, will make all this much eaſier than words can do.

I would in general remark, that if the heights of the ſeveral parts are ſet upon the axis A B, then thoſe points will invariably be the centers for the correſponding parts; and if thoſe lines are continued to the horizontal line, this will likewiſe give the vaniſhing point of ſuch lines: thus A is a correſponding point to o, and o A vaniſhes into L, &c.

This rule will ſerve univerſally for circular buildings; and by this principally it is that the remaining figures to this work are produced, and therefore the leſs may be ſaid when I come to them.

In the fourth figure, I have given a finiſhed example; and in the fifth figure (by taking away the fore part of the object) we have an example of columns that are placed in a concave manner; as the inſide of a round temple, or the like.

Plate LXIX. For a circular temple.

This example contains an application of the rules in the laſt plate, which are ſo obvious as to need no farther explanation: for Fig. 1 is the elevation; Fig. 2 is one quarter of the plan; and the dome is found by the rules for drawing a globe in plate 8.

Plate LXX. Here we have a finiſhed example of the laſt plate; and it is a view of a temple in the gardens at Kew, belonging to Her Royal Highneſs the Princess Dowager of WALES: it is called the Temple of Victory.

Plate LXXI. For determining the perſpective of columns, in any ſituation; even that variety of them, which is ſhewn in the laſt plate.

Fig. 1. Either upon the picture, or on a ſeparate paper, give the centers and diameters of the columns, as they are diſpoſed upon the plan: thus 4 is the center of the firſt column, a b it's diameter; c is the center of another; and e that of the fartheſt column. Now if we make A 1 as a ſcale for receiving the ſeveral diſtances of the columns, then we may by one rule find all their places in perſpective;

 therefore

therefore from c, d, e, draw perpendiculars to A 1 ; which lines c 3, d 2, e 1, will ſeverally meaſure the diſtance of each center from the line A 1, and alſo give the ſpaces, or intercolumniations, of the columns, viz. 4 3, 3 2, and 2 1.

At Fig. 2, make C A, C L, equal to C A, C L of Fig. 1, and draw A 1 parallel to C L ; then make A 1 (Fig. 2) equal to A 1 (Fig. 1) and from 1 draw to C ; now take the diſtance 1 e of the center e (Fig. 1) and transfer it from 1 to f (Fig. 2) then draw f L which gives the point e in perſpective, for the center of the column as placed in the plan at e (Fig. 1.) Again, for the height ; place this upon 1 6, and draw to C, which gives e g for it's perſpective height. Again, for the diameter ; put one half of it at 1 a, draw the parallel b e, and then draw a line from a, to C, &c.

[illegible] ſame manner find all the other columns as in Fig. 3 ; where the ſame rule only is repeated four times for the four columns.

Or, having determined the height and breadth of one column, the others may be drawn from this, when the center of each column is determined, provided there be room enough upon the picture ; thus from the column c m, to find the height of the column d n : draw through c and d to cut the horizontal line in K ; then from K draw to m, which gives d n for the height of the column, &c.

These columns are likewiſe to be found by calculation, viz. from given numbers, as expreſſed in Fig. 1 : for thoſe numbers which expreſs given lines, may as eaſily be taken from a ſcale, as the lines themſelves can be taken from a plan, &c.

Now by attending to theſe figures, and conſidering the application of this rule, in a variety of inſtances, (or, which is much the beſt, by drawing ſeveral examples with it) we ſhall find with what eaſe and facility, a great variety of columns, in all kinds of ſituations (or other objects) may be produced, and that too with the greateſt expedition.

And after the learner has drawn ſeveral examples of this kind, and is a perfect maſter of the preceeding part of this work, he may then venture to attempt drawing that moſt elegant ſtructure, for which he has the outlines, &c. in the next plate ; and a finiſhed print of it to conclude with. But previous to his doing this (and to help his reflexions upon it) I will give a few uſeful and neceſſary hints, which may make the operation ſtill eaſier to him.

Plate LXXII. Fig. 1. is one quarter of the plan, drawn to one third of the propoſed ſize of the building : and on the line 1—28 are placed the centers for each column, &c. which are ſet off (viz. three times as large) upon the bottom line 1—28 of Fig. 3. At Fig. 2, is as much of the elevation as is wanted : the perpendiculars which are dotted, contain the heights of the pedeſtals, columns, and entablature in theſe places. Y Z is the axis of the dome, and K is it's real height. A D is the given height for the columns, &c. to the circular part ; and the perpendicular from 20, contains the heights of the columns, &c. to the arch. The point a is the center of the colonnade (viz. the perſpective of c, Fig. 1) and a d is the axis to which all the modilions, the capitals, baſes, &c. tend ; as was ſhewn in Fig. 2, plate LXVIII.

Plate LXXIII. We have here a little more than one half of a moſt magnificent deſign, which was made and given me for this work ; and which (if well executed) would make an excellent piece of ſcenery for a theatre.

Thus have I finiſhed with all I propoſe doing in this work, viz. giving new rules for drawing the five orders of architecture in perſpective, with facility and exactneſs ; alſo how to determine the perſpective of ſhadows, and an application of all this to buildings in general.

Now

Now what has been already done will ſhew us how to delineate a variety of objects, and in ſuch ſituations as are generally attended to by architects; ſo that in regard to ſquare objects, I have hitherto drawn one ſide of them parallel to the plane of the picture, becauſe then the center of the picture became the vaniſhing point of the other ſide. This manner of working comprehends the firſt, and a moſt eſſential part of the perſpective of architecture, which has hitherto been treated by other authors with great labour and perplexity. But various are the ſituations which may be given to objects, and thoſe that are ſquare will, if drawn angle-ways, make very agreeable forms in a picture; becauſe the lines have a tendency to contraſt, or oppoſe each other; and they are therefore preferred on many occaſions. This is a part I have not hitherto conſidered, and beſides this there is alſo the perſpective of Domes and Cielings, of Scenes for Theatres, &c. &c. all which ſhould be fully explained and illuſtrated by theſe new principles, before the whole of Perſpective (I mean as it relates to the imitative arts only) can be properly compleated.

But this (as I hinted in the introduction) muſt be the buſineſs of another volume; wherein I propoſe giving for examples, ſome of the antient Temples, and other buildings of antiquity; and a few of the moſt elegant modern ſtructures: which would make a work more pleaſing to the generality of readers, and if properly executed, a uſeful performance. However, before I ſhall venture upon ſuch an arduous and expenſive undertaking, it is neceſſary to ſee whether this part be worthy of public regard. And, leſt I ſhould not be encouraged to proceed any farther in this moſt delightful ſcience, I will here ſubjoin the following remark, from which the ingenious reader may eaſily form to himſelf a method for drawing ſquare objects, that are obliquely ſituated, and to give each ſide of them any breadth he pleaſes.

R E M A R K.

Now all that is neceſſary for the above purpoſe, is to find the proportion which the diagonal of a ſquare has to its ſides. And this figure being a right angled triangle, therefore if we call each ſide 7, then (by the 47, 1 Euc.) we ſhall find that the hypotheneuſe is 9, 9-10ths. And having thus ſettled thoſe given proportions, we can by an application of the former rules, obtain the perſpective of any ſquare building that is to have an oblique ſituation. Indeed I ſhall ſuppoſe that the ſides are equally oblique, with reſpect to the picture; but by changing the poſition of the object to the right or left hand, we ſhall ſee more or leſs of each ſide, and conſequently be enabled to make the ſides of it wider or narrower, as we ſhall think proper. This is evident by Fig. 5 and 6, of plate 7 1. But for the operation.

C A S E I.

Fig. 4. When the building is to be placed directly in the middle of the picture.

1. Give a b for one ſide of a ſquare, and (with the compaſſes) fit a b to VII, VII on the architectonic ſector, or to 7, 7 on the line of lines upon the common ſector; then take the diſtance 9 and 9-10ths, and make A B equal thereto.

2. From the points of diſtance H and L, draw lines through A, B, meeting each other in d; then is A d the perſpective of one ſide, and B d another.

3. Give e d for the height of the building; draw the perpendiculars A h, B g, and then from e to H and L, &c.

And ſuppoſe we would divide the ſides, as B d, into any parts in perſpective; then from d draw the parallel d 1; and from P l through B will cut off d 1 for the real length of d B; therefore by dividing d 1 (ſuppoſe in 2) and drawing from thence to P l, we ſhall do what was required.

By the ſame operation, Fig. 5 is produced, with this difference only, that the line A B is taken on one ſide of the center C.

From hence then we ſee how ſquare buildings, that are obliquely ſituated, or ſquare mouldings of every kind, may be produced in perſpective; and with as much eaſe and exactneſs as thoſe which are placed in a parallel direction.

As for the manner of drawing circular planes of every ſpecies; ſince the diameters, in every ſituation of a building, may be taken from a parallel ſection, therefore the ſame rule for drawing a circle from a given diameter, will hold univerſally true. Thus if a b in either of the above figures, be the given ſide of a ſquare, it is likewiſe the diameter of a circle, that is inſcribed within it.

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PRINCE OF WALES.

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Plat. 1

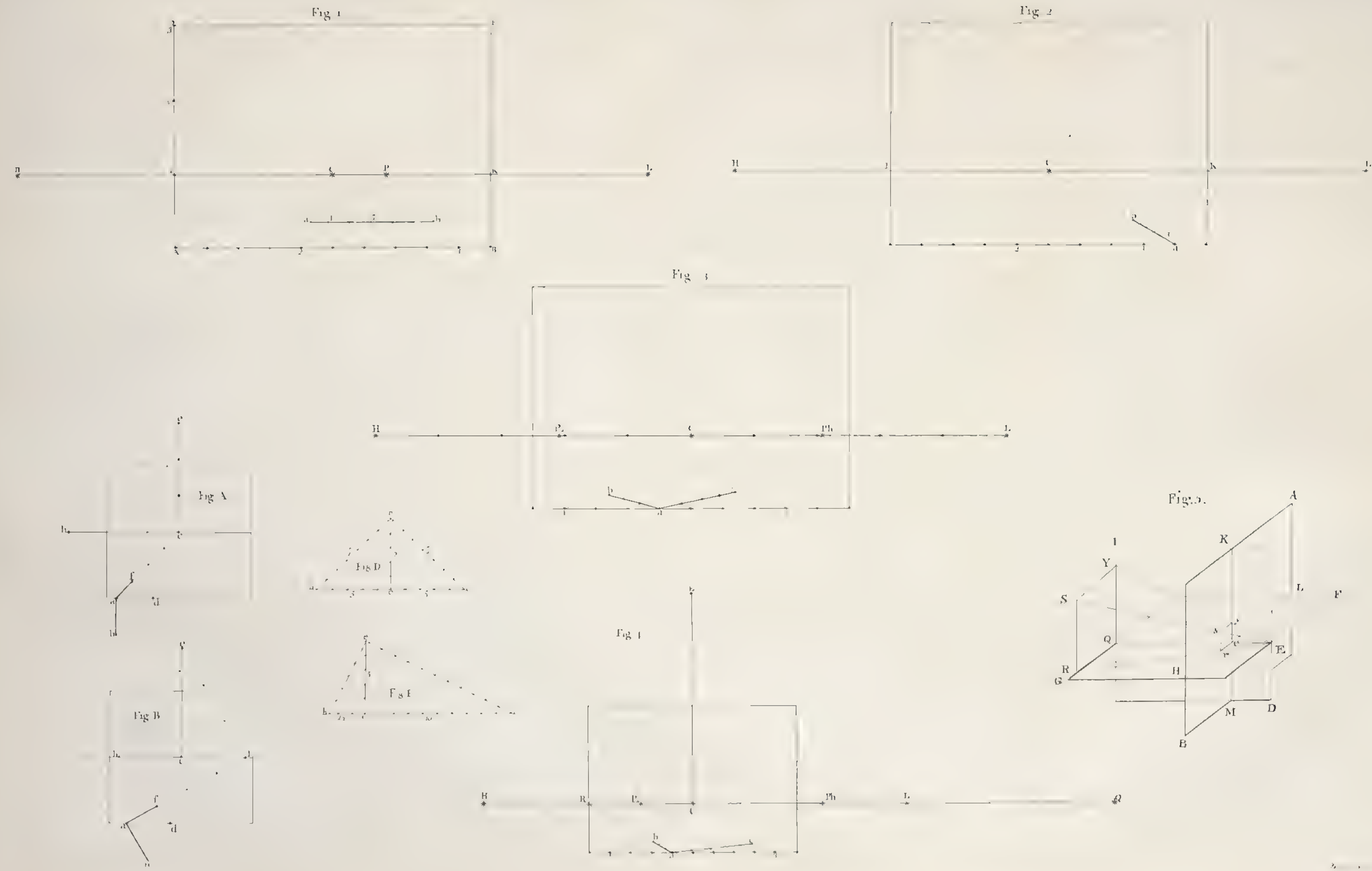


Fig. 5

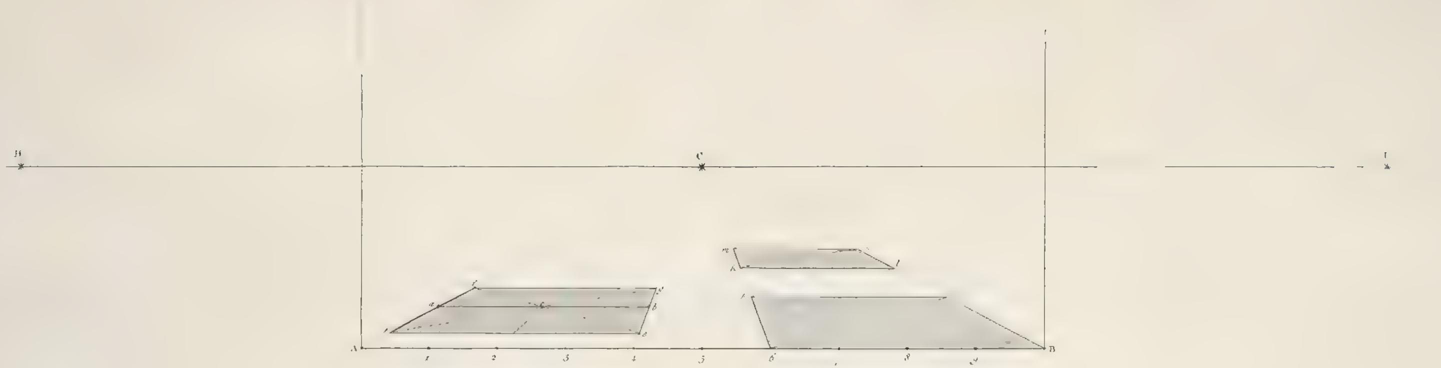


Fig. 6

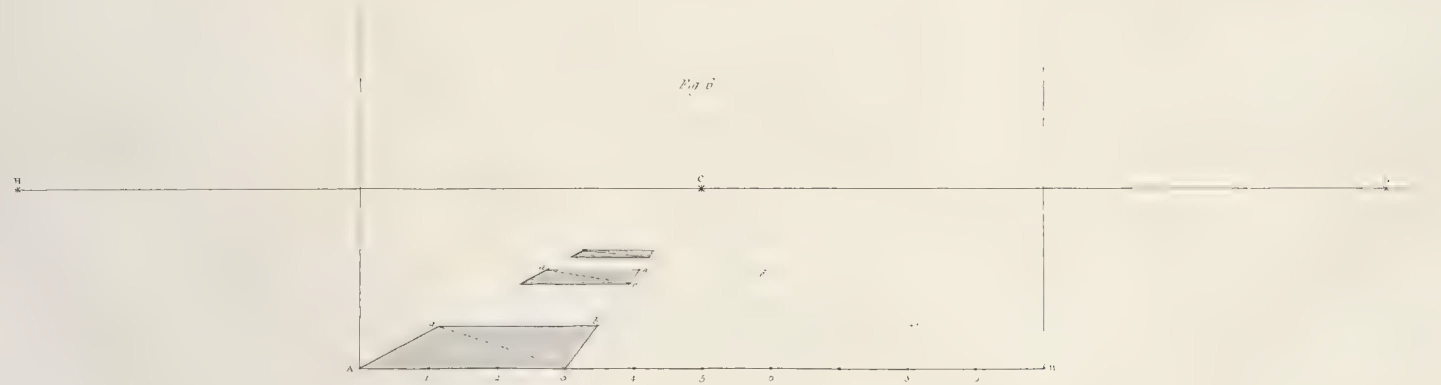
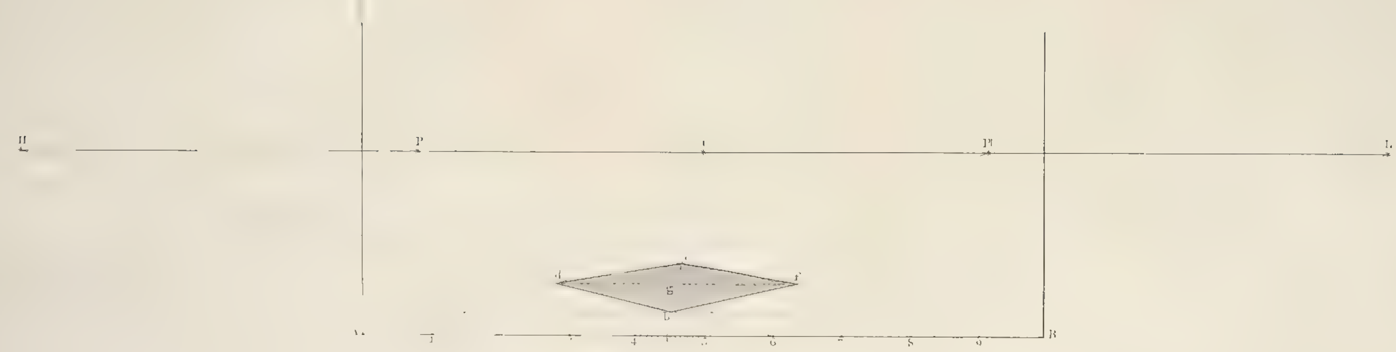


Plate III.

Fig. 7.



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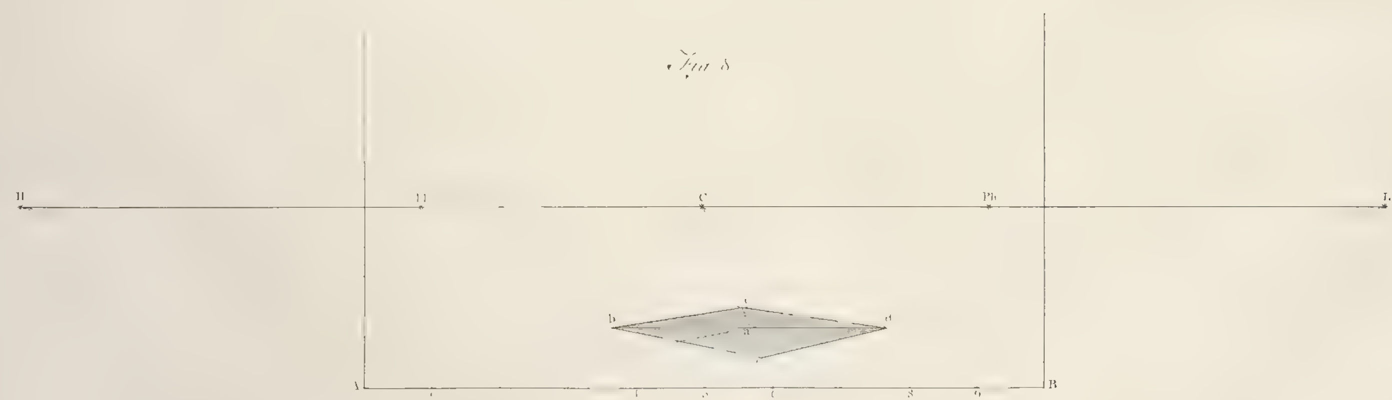


Pl. IV.

Fig. 9.

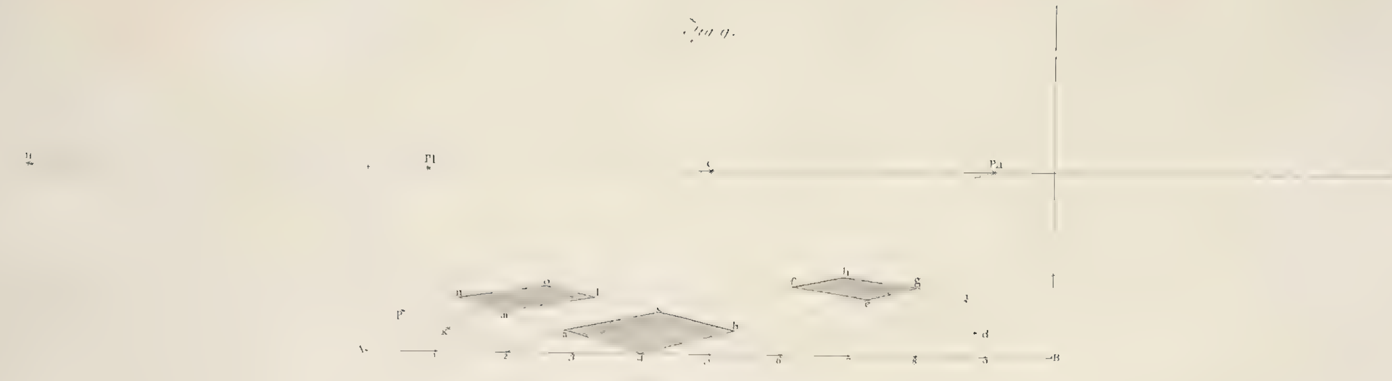


Fig. 10.

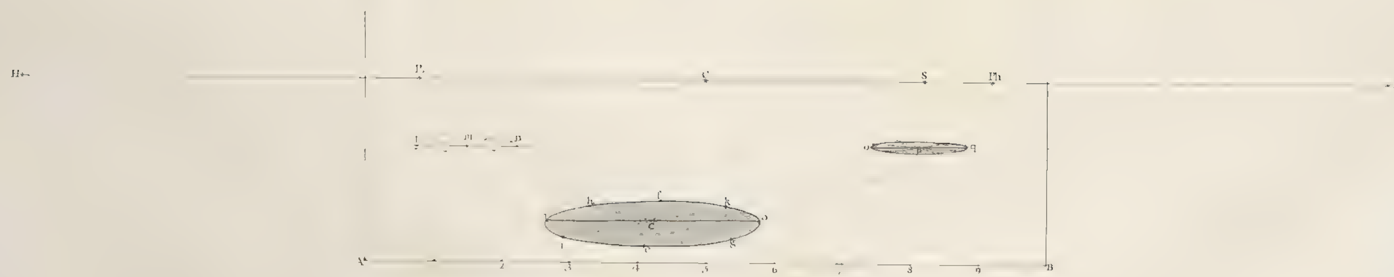


Plate V

Fig. 11

Fig. 12

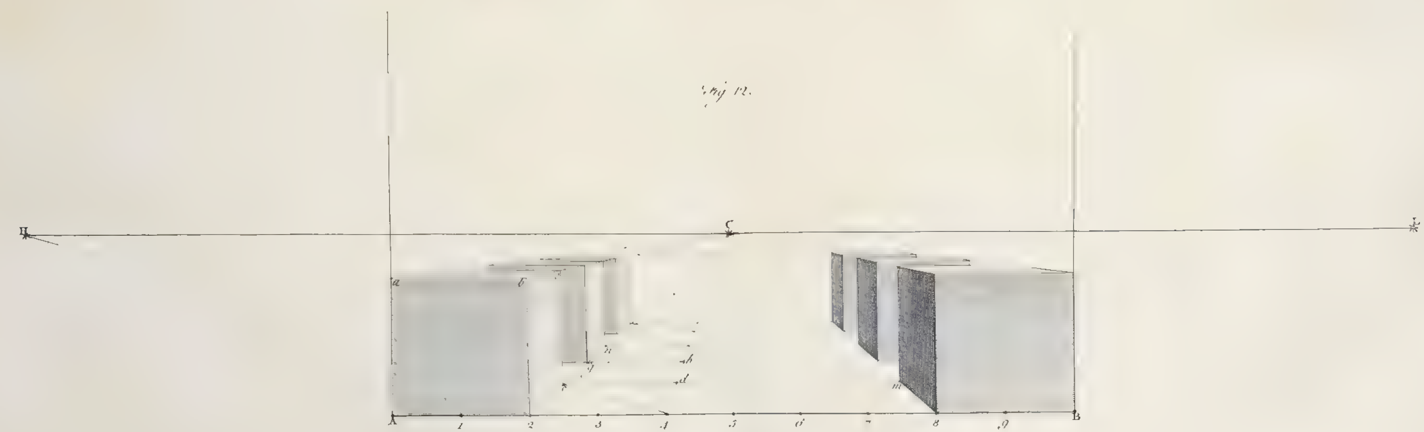


Plate VI

Fig. 13

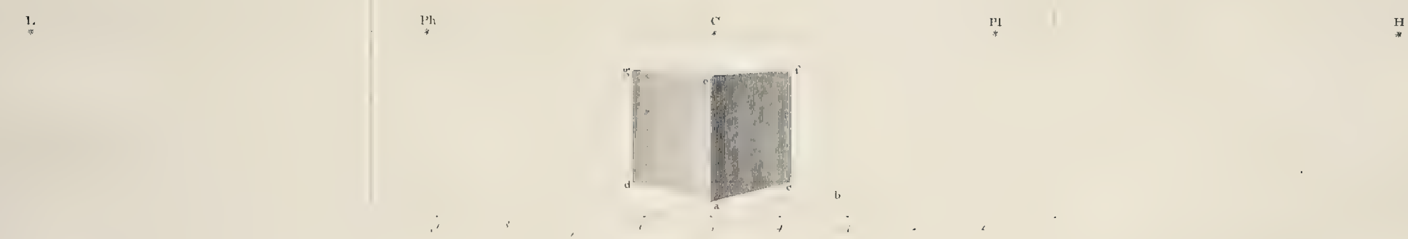
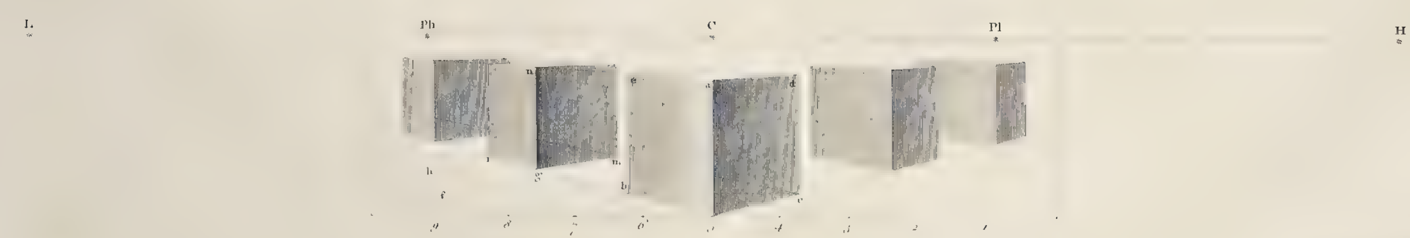


Fig. 14



J. Walker sculp

Plate VII

Fig 15

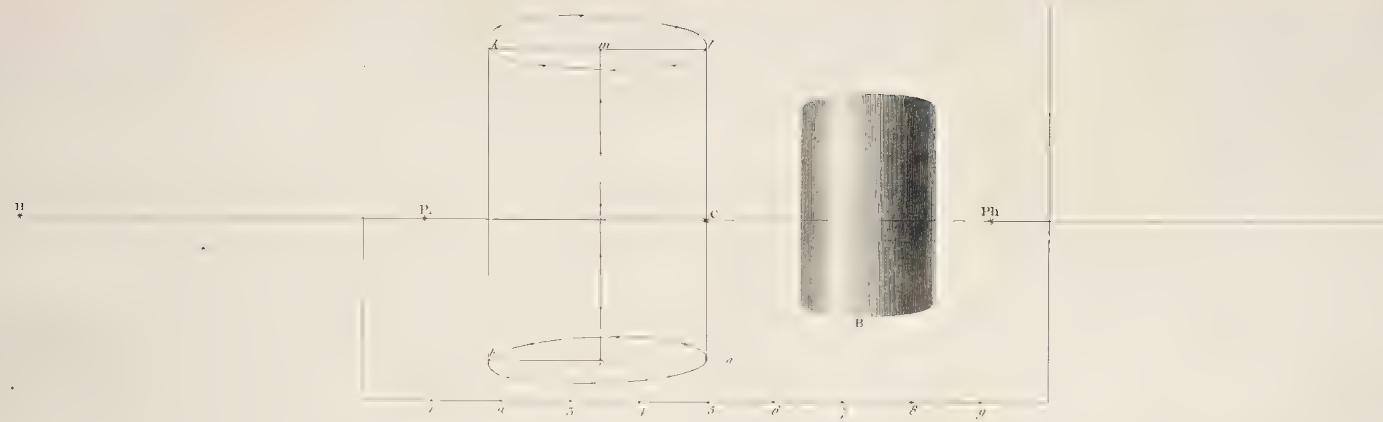


Fig. 16

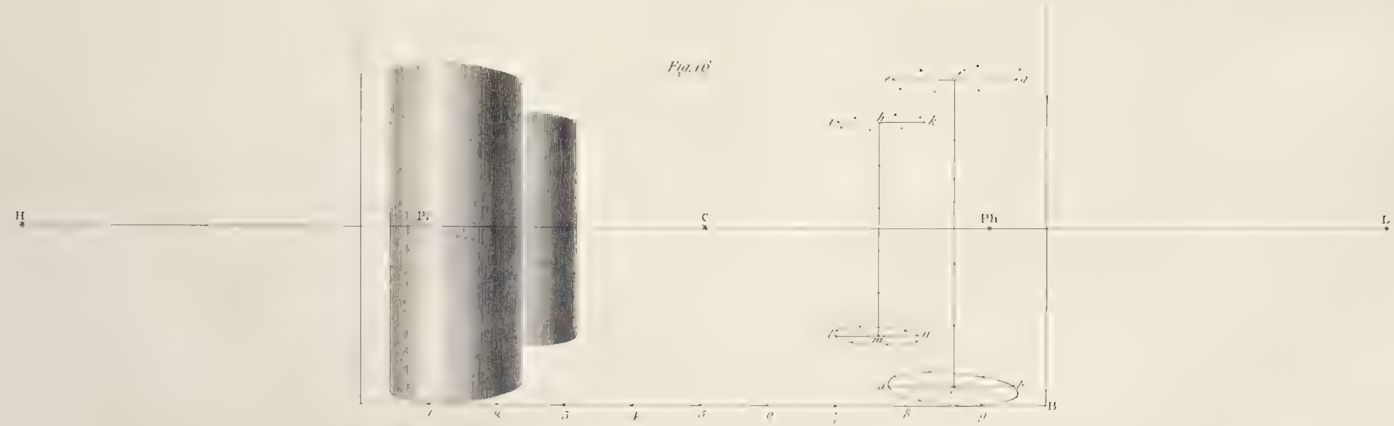


Plate VIII

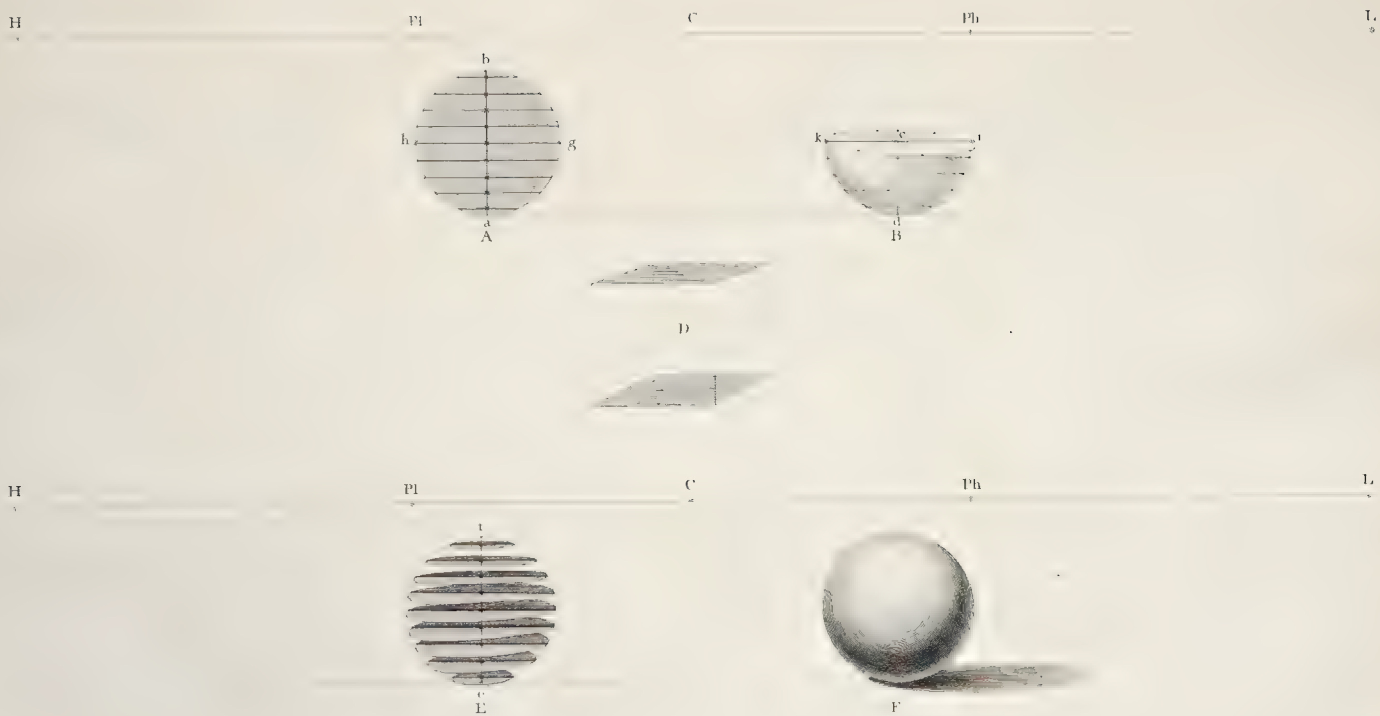


Plate IX

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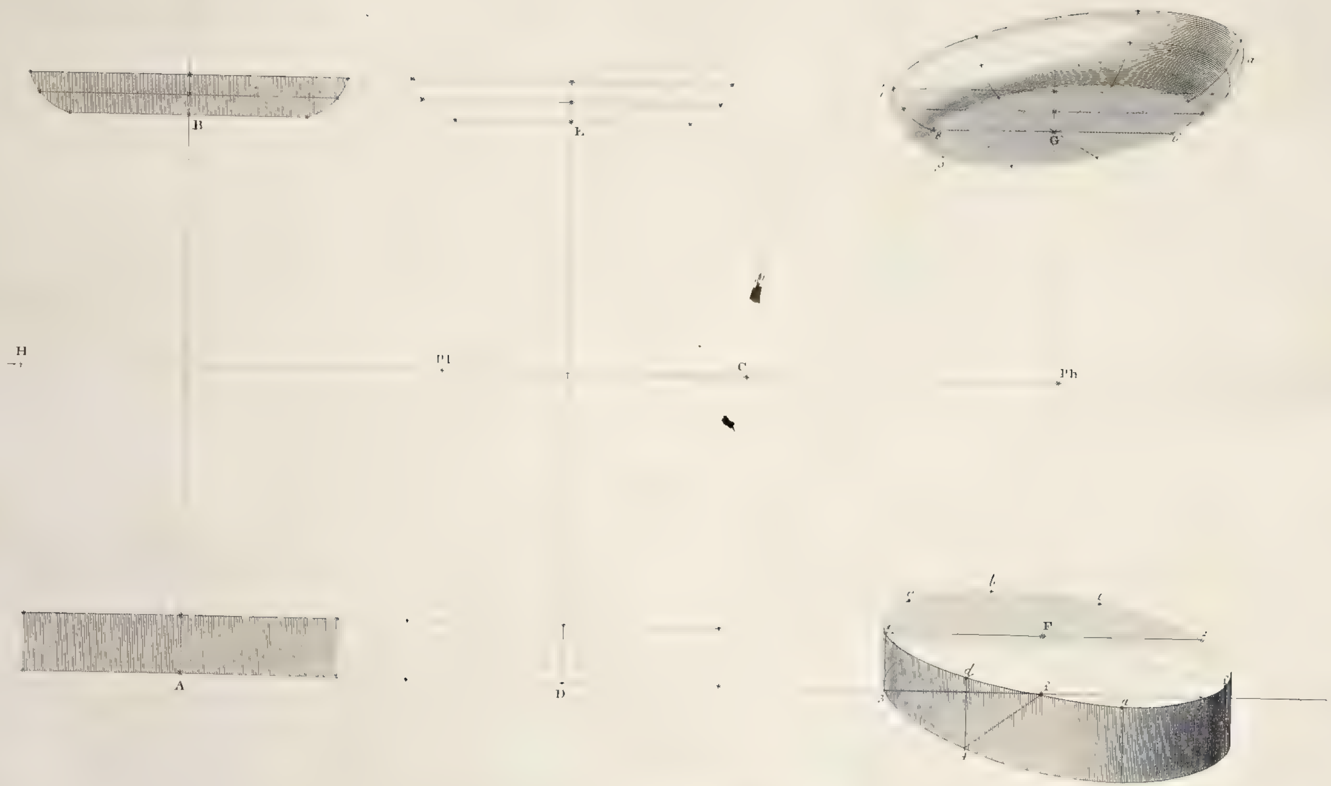
A. Walker sculp

Plate X.



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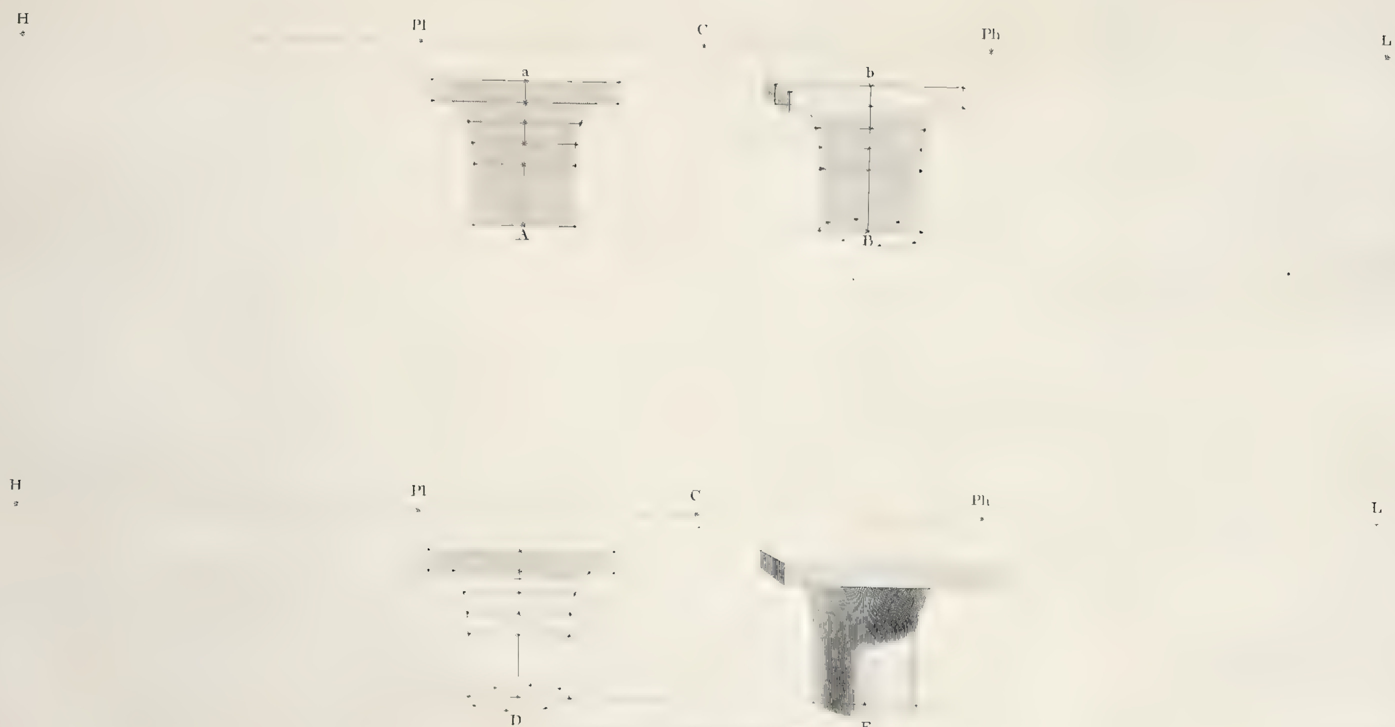
A Walker sculp.

Plate XI



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A. Walker sculp

Plate XII

Plate XIII.

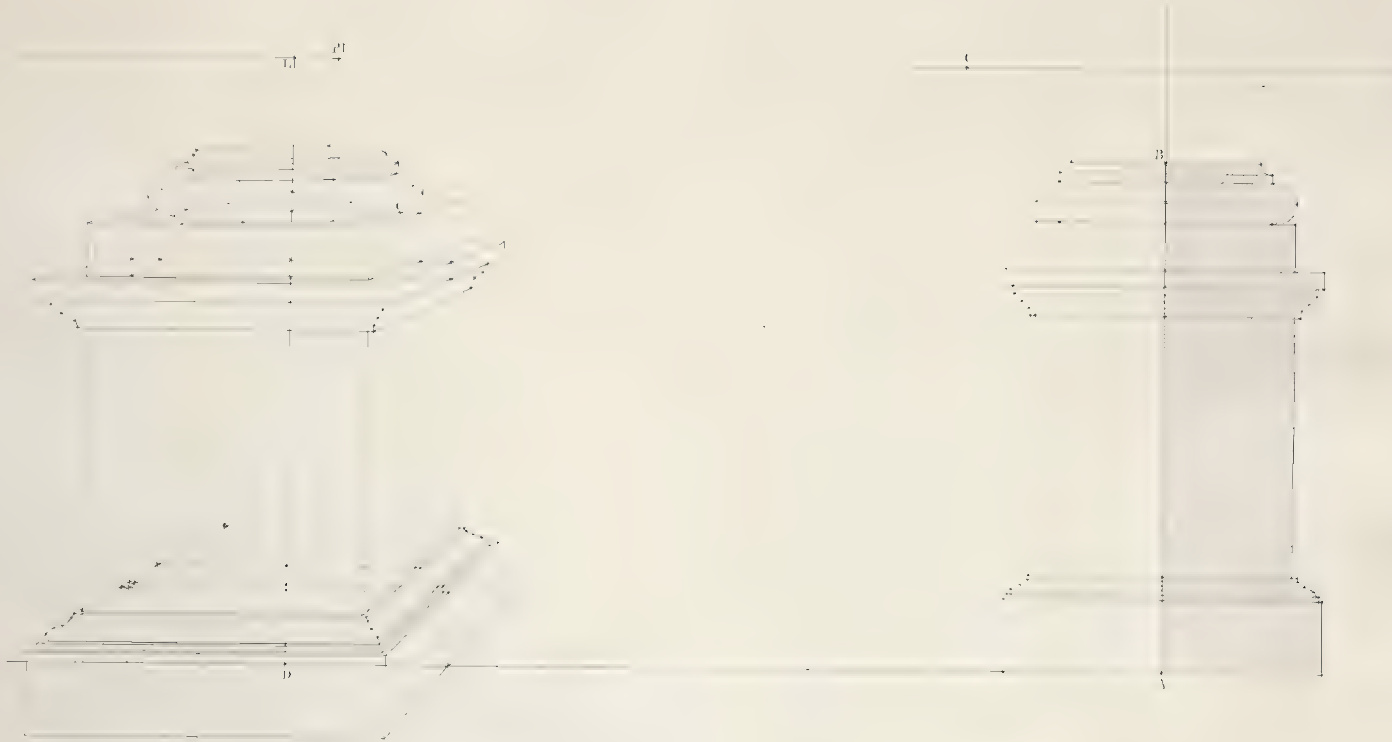

Plate XIV

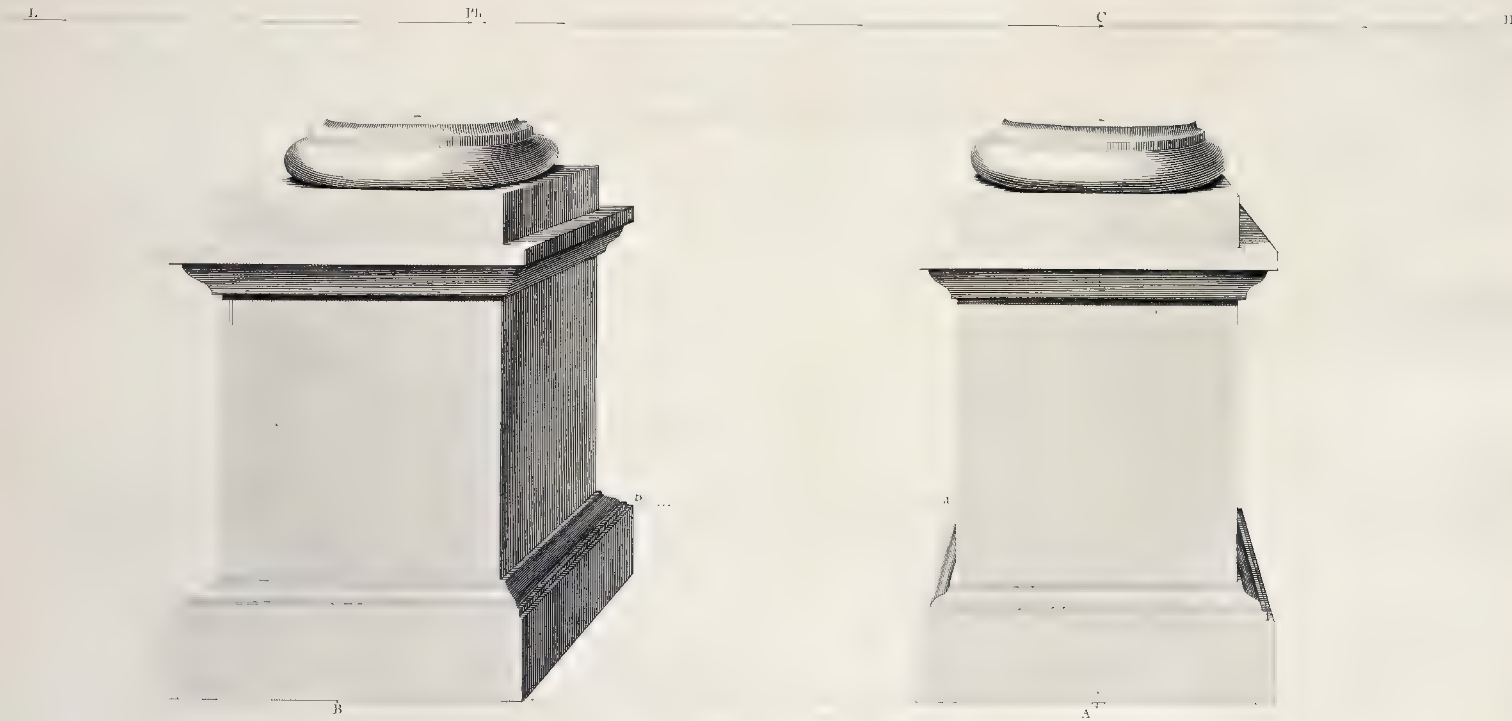

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Plate XV.

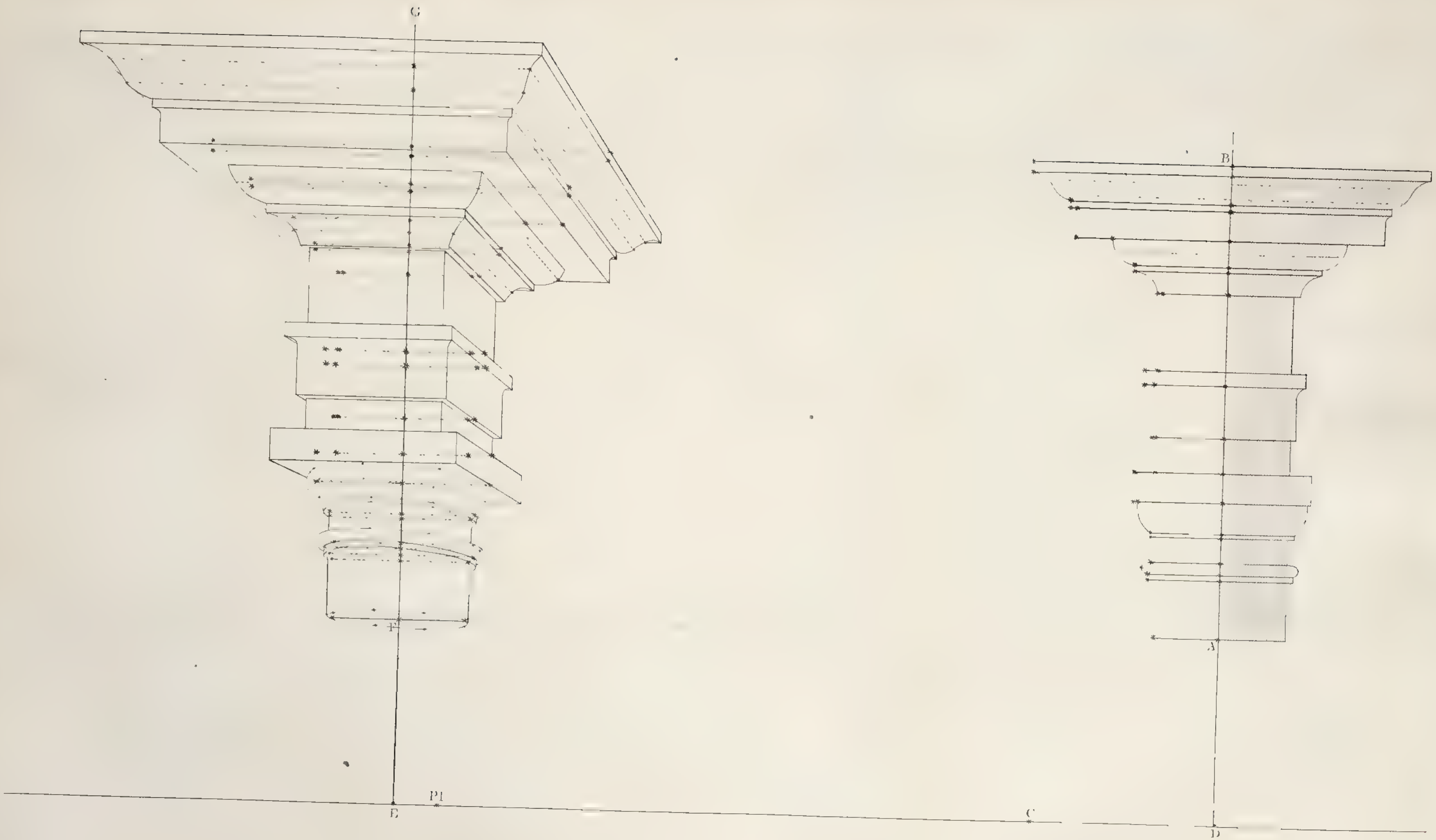

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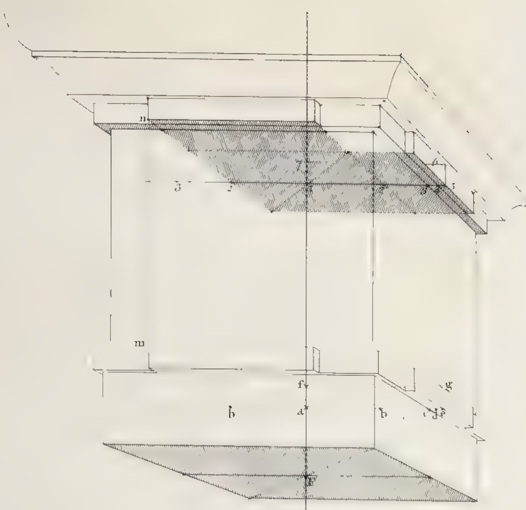
Plate XVI

Plate VII

Fig. H



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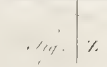

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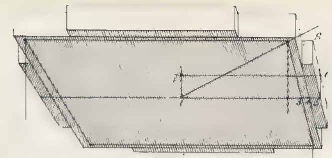

Fig. D.

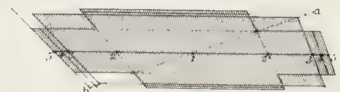

Fig. G

Fig. X

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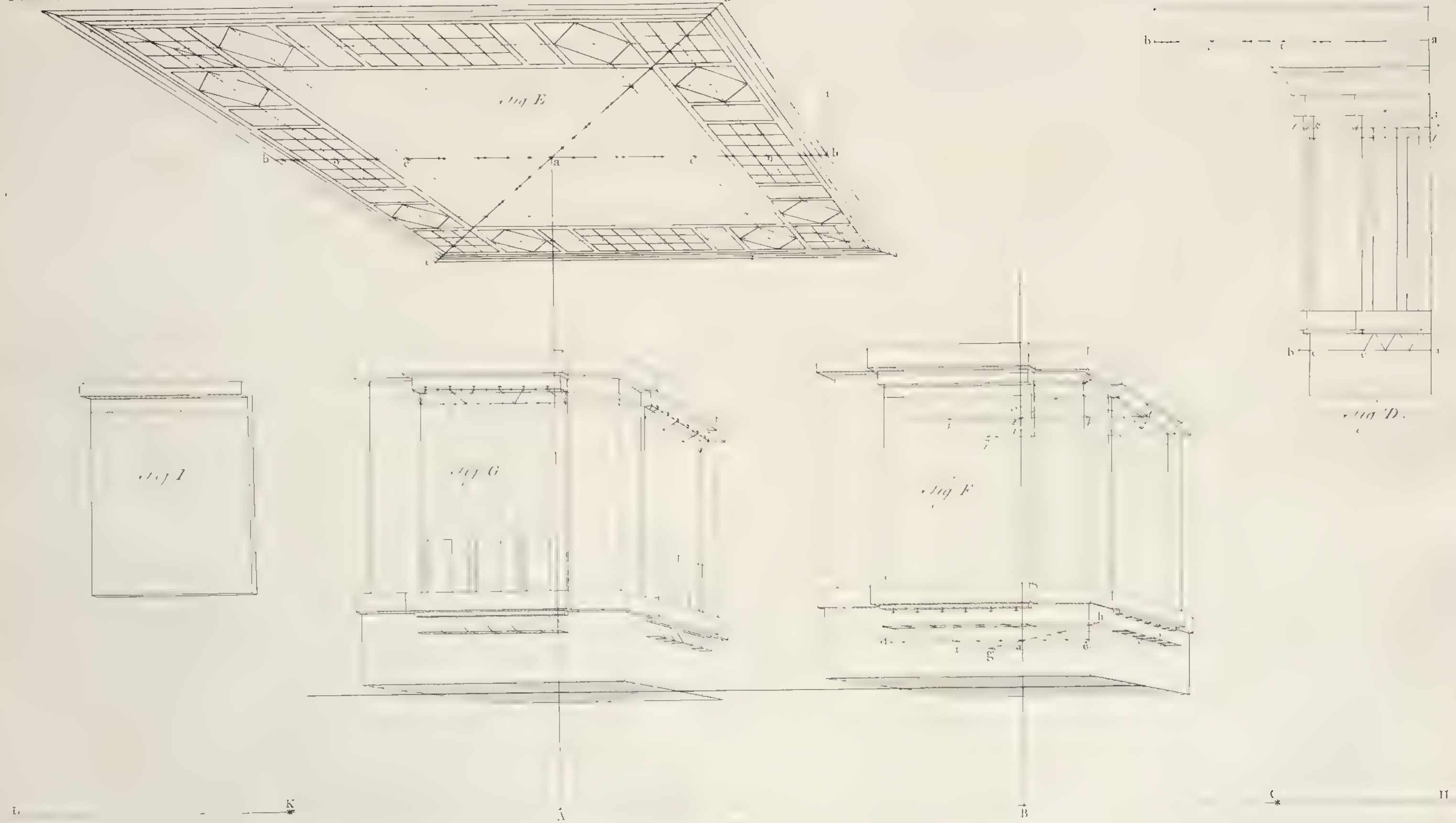
Plat XVIII



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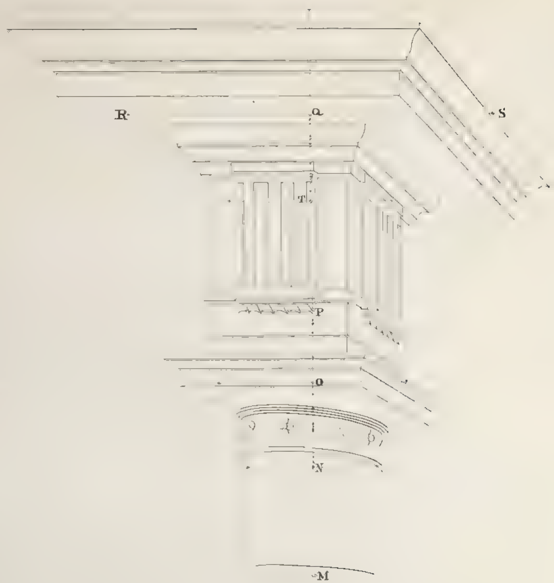

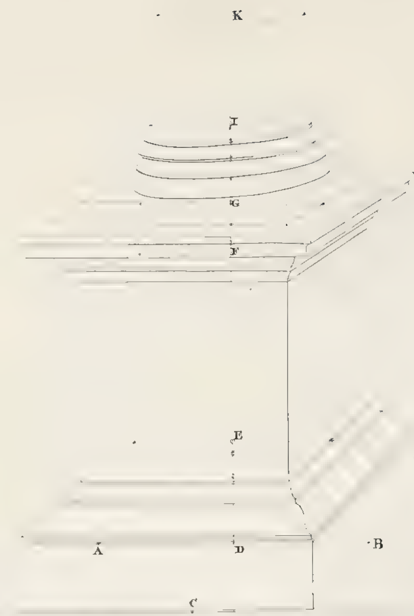

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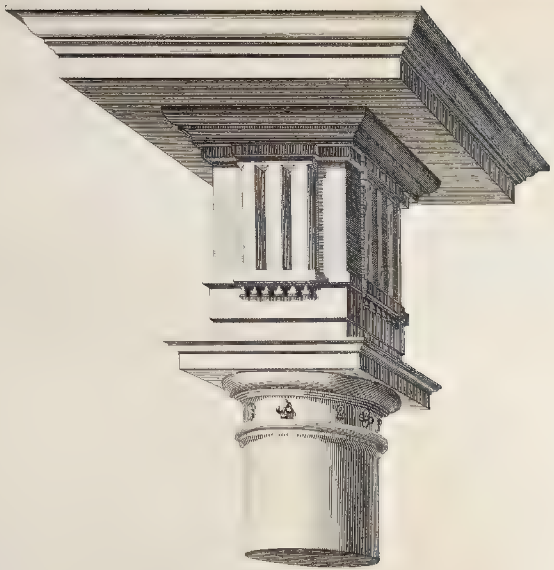

Fig. B.

Fig. A.

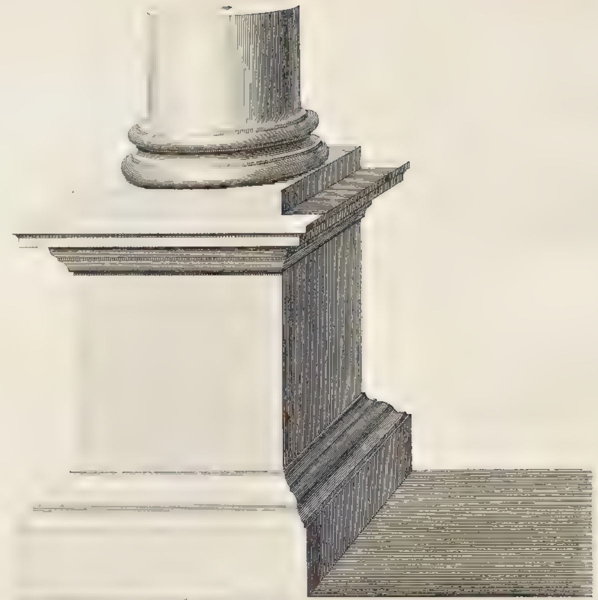

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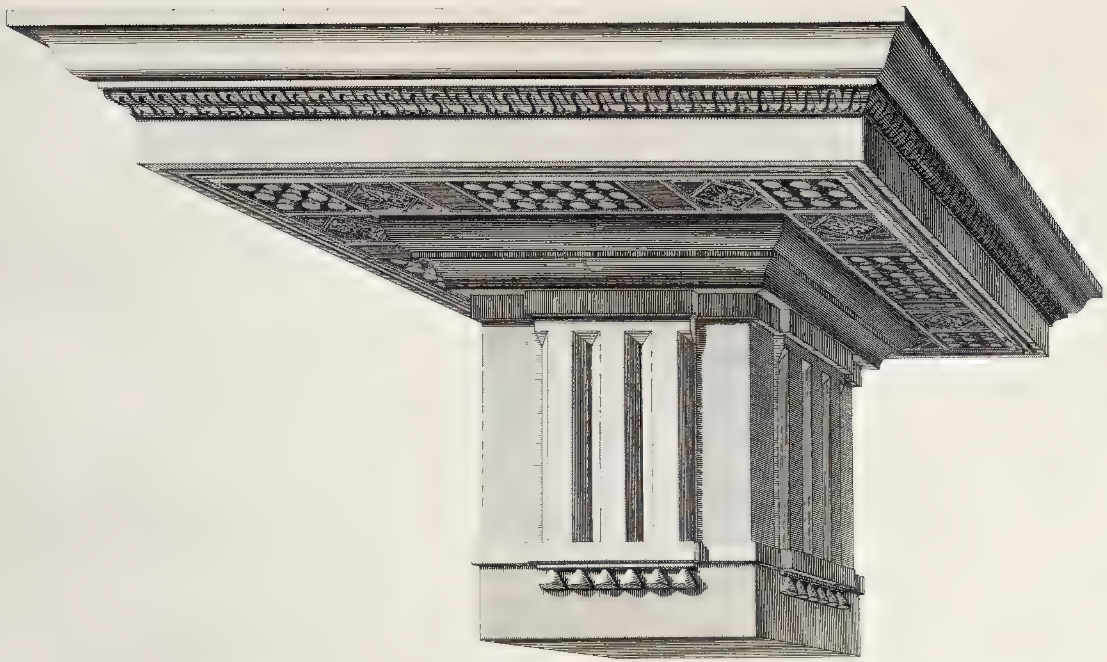
Plate XXI.



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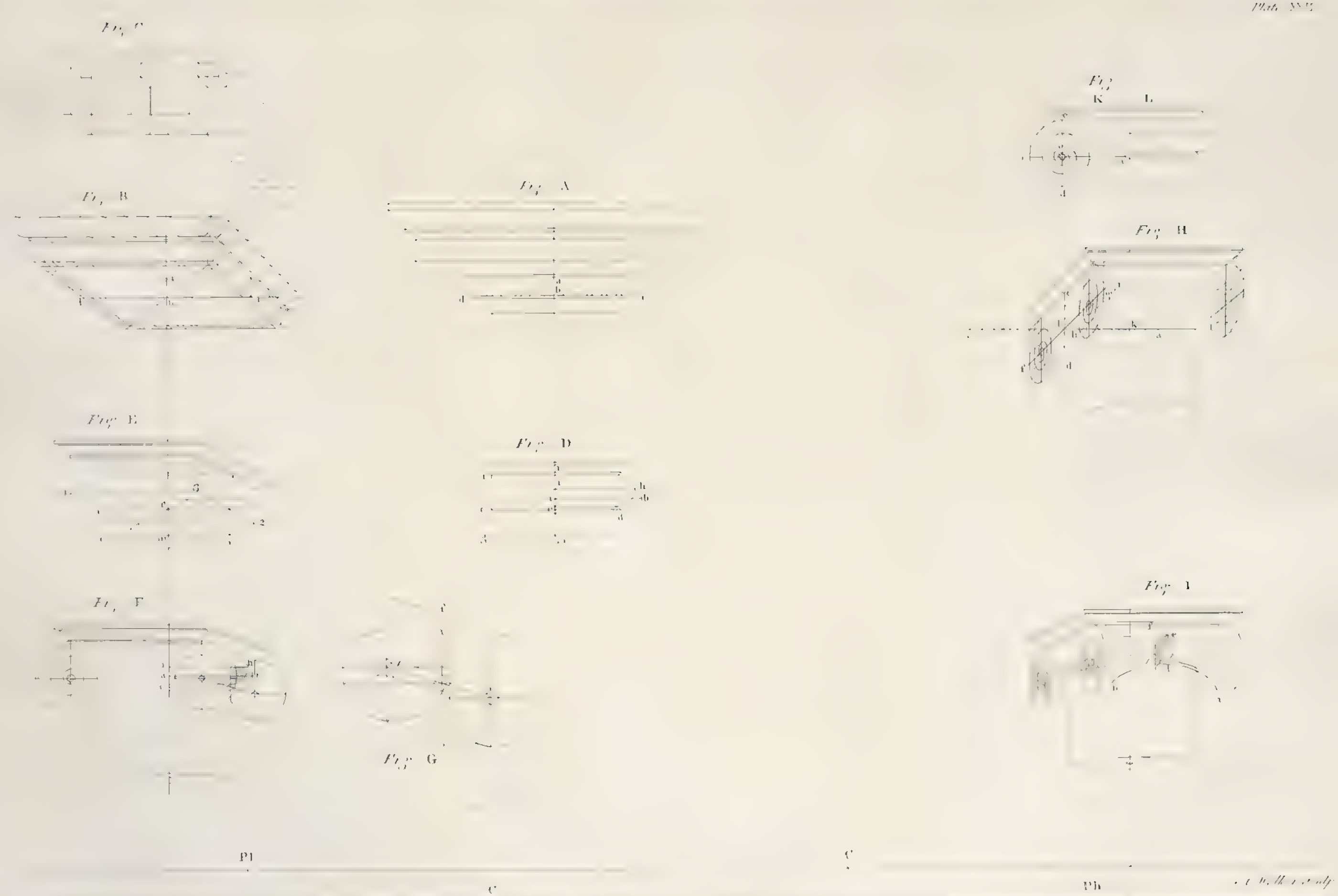

Fig. C
Fig. B
Fig. A
Fig. K L
Fig. H
Fig. E
Fig. D
Fig. F
Fig. G
Fig. I
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C
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Plate XXIII.

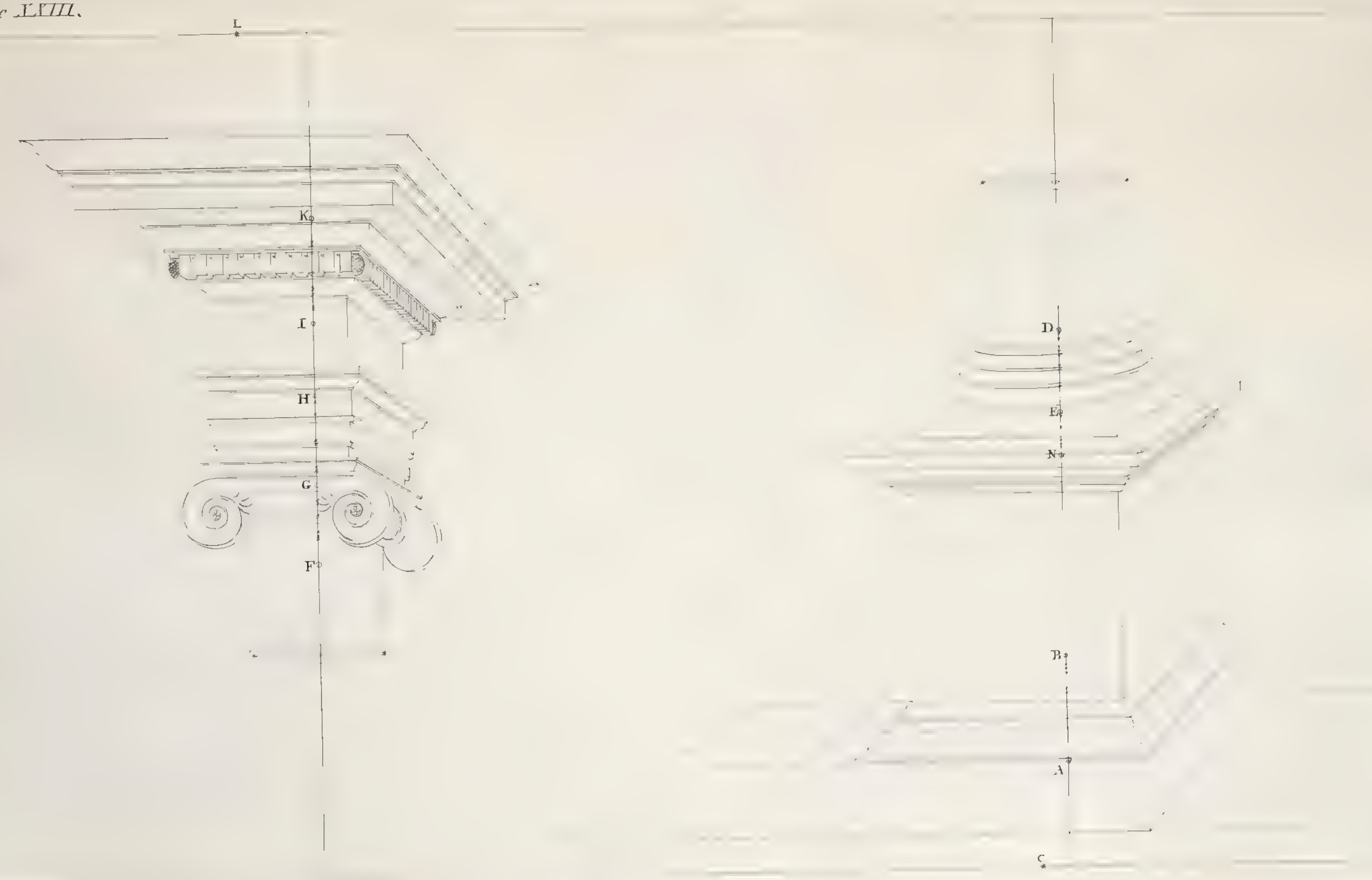
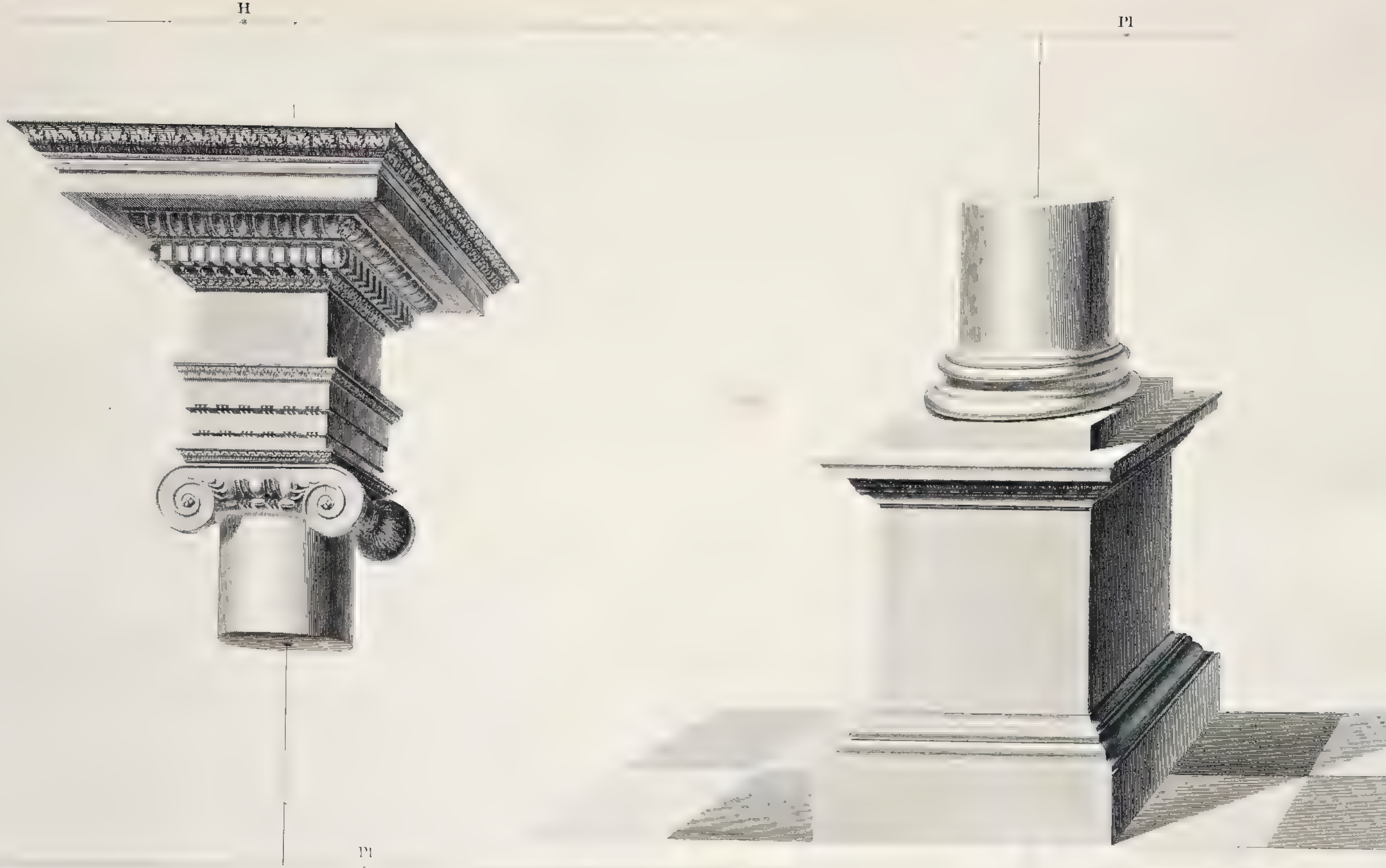


Plate XXV



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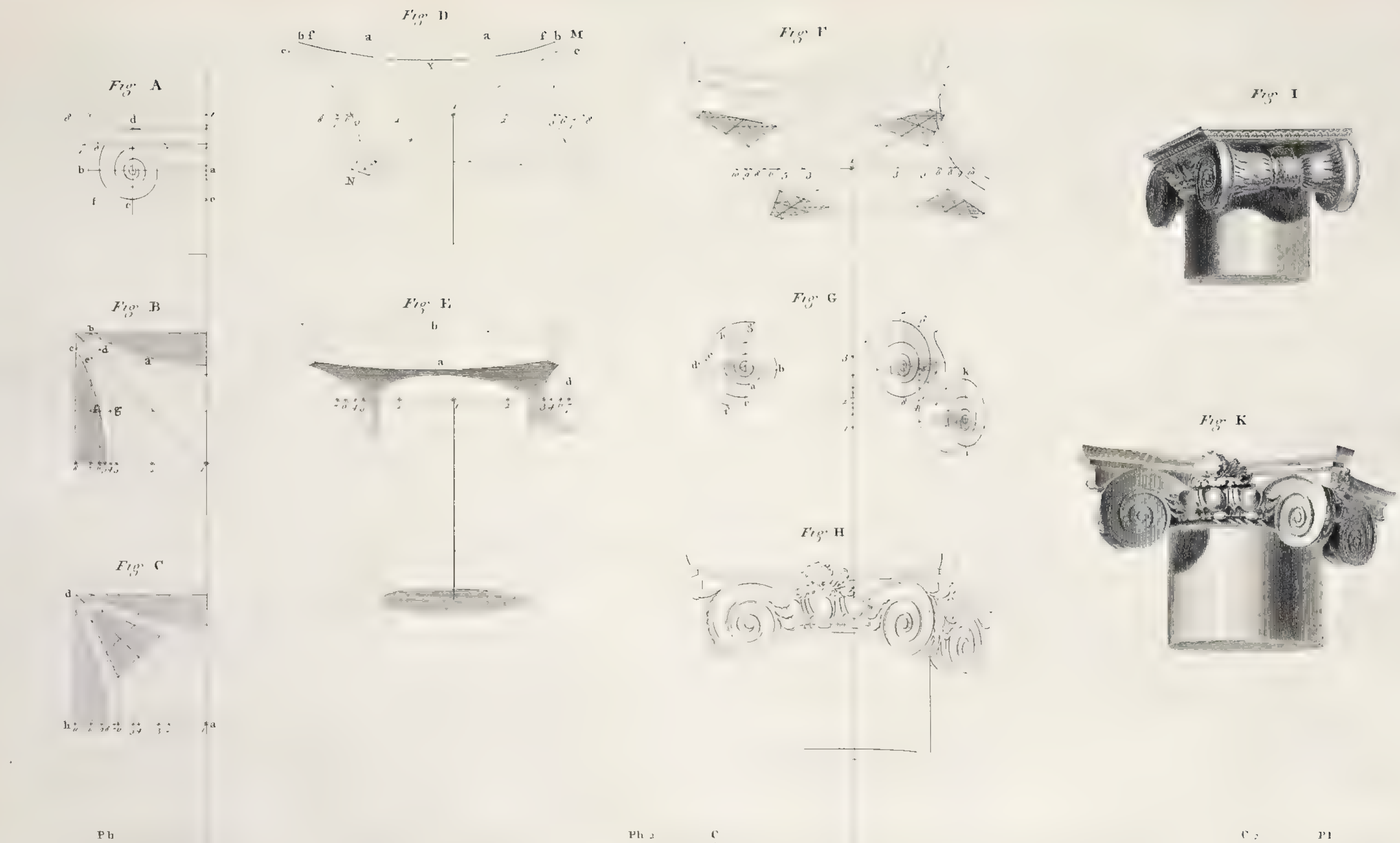
A. Walker sculp.

PLATE XXV.



A. Walker sculp.

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Plate . XXVI

Fig. 1

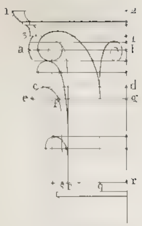


Fig. 2

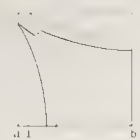


Fig. 3

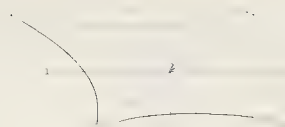


Fig. 4

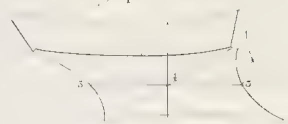


Fig. 5

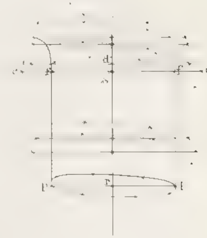


Fig. 6

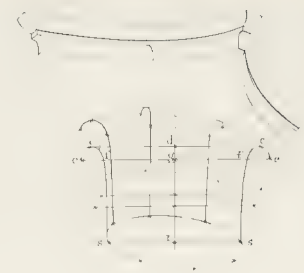
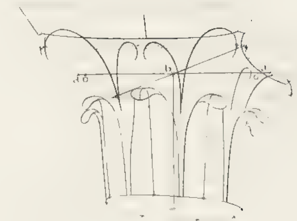


Fig. 7



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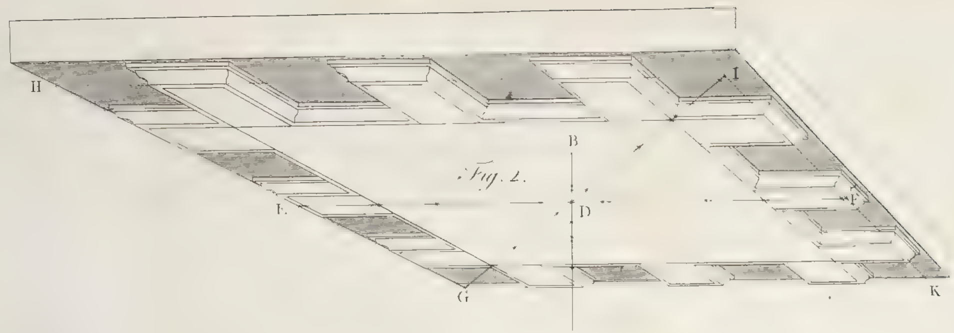


Fig. 2.

Fig. 1

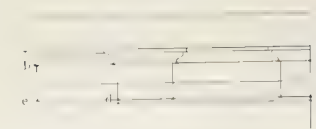
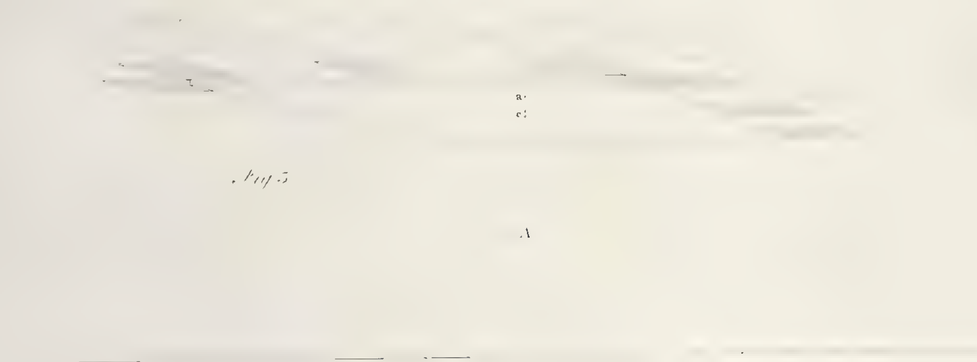


Fig. 4

Fig. 3



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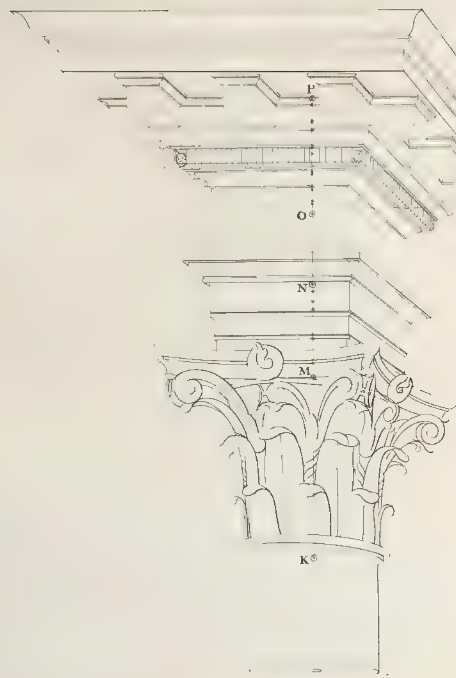

Fig. B

Pl

Pl

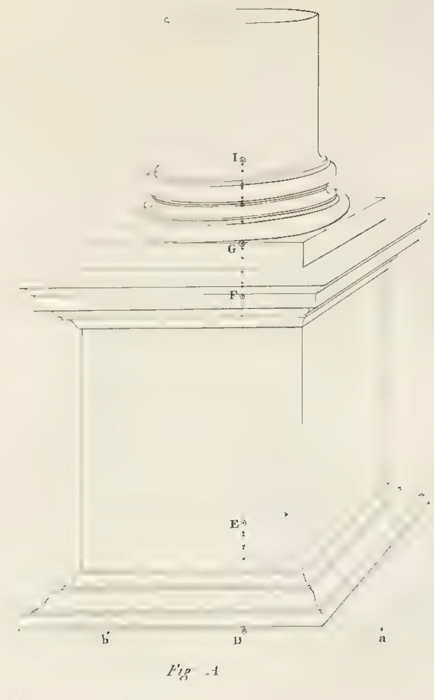

Fig. A

C

P. Mazell sculp

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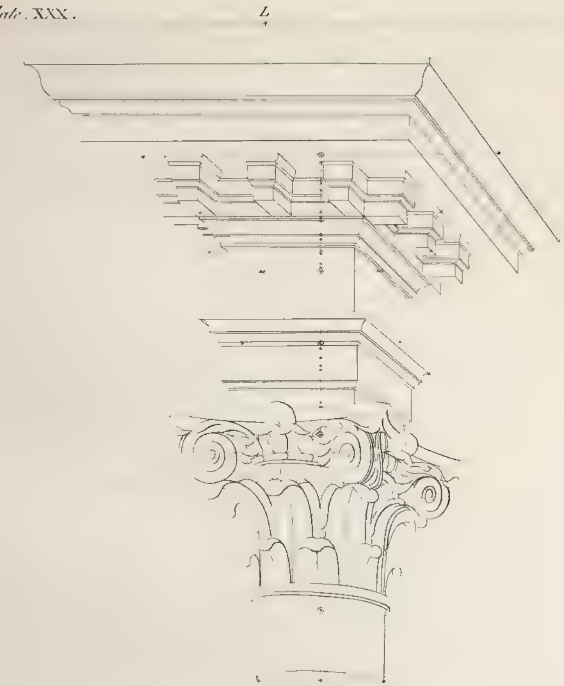
Plate XXIX

Plate. XXX.



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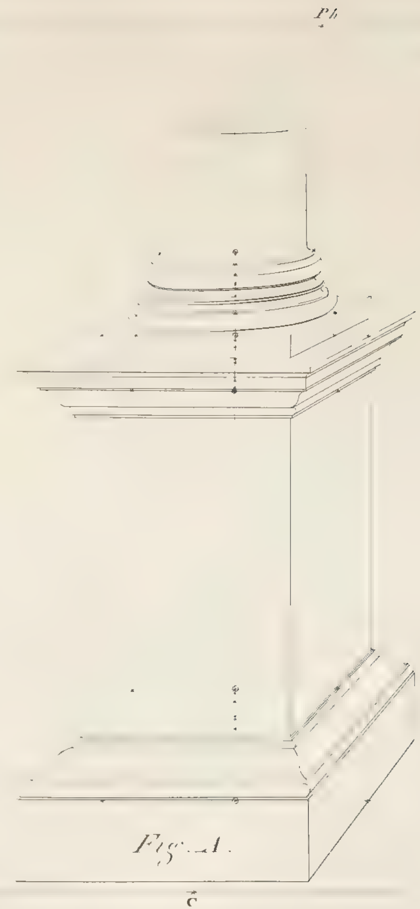

Fig. A.

P. Mazell sculp.

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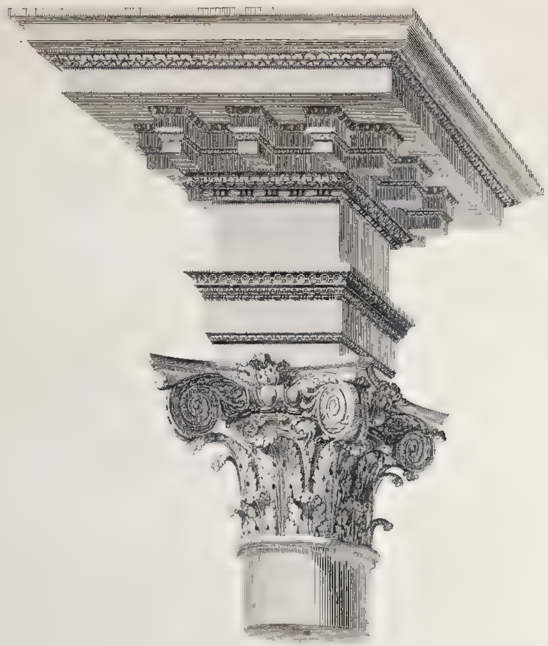
PLATE XXXI



H. Wilkes sculp

Plate XXXII

Fig. I

Fig. II

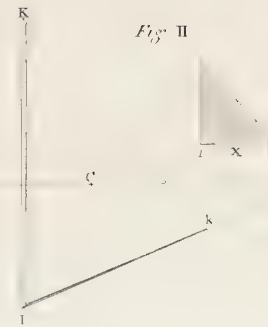


Fig. III.

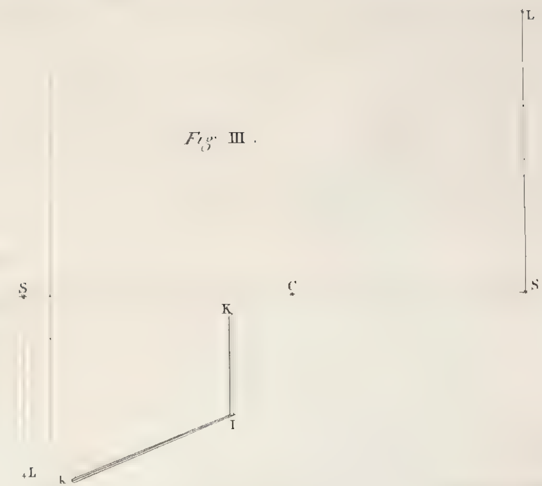


Fig. IV

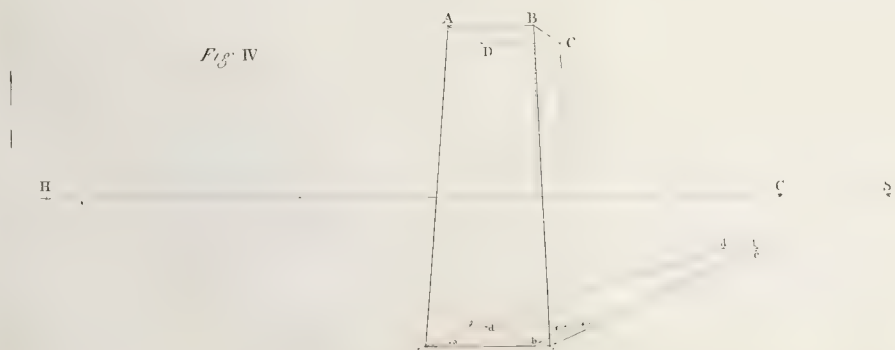


Fig. V

Pl. XXVIII

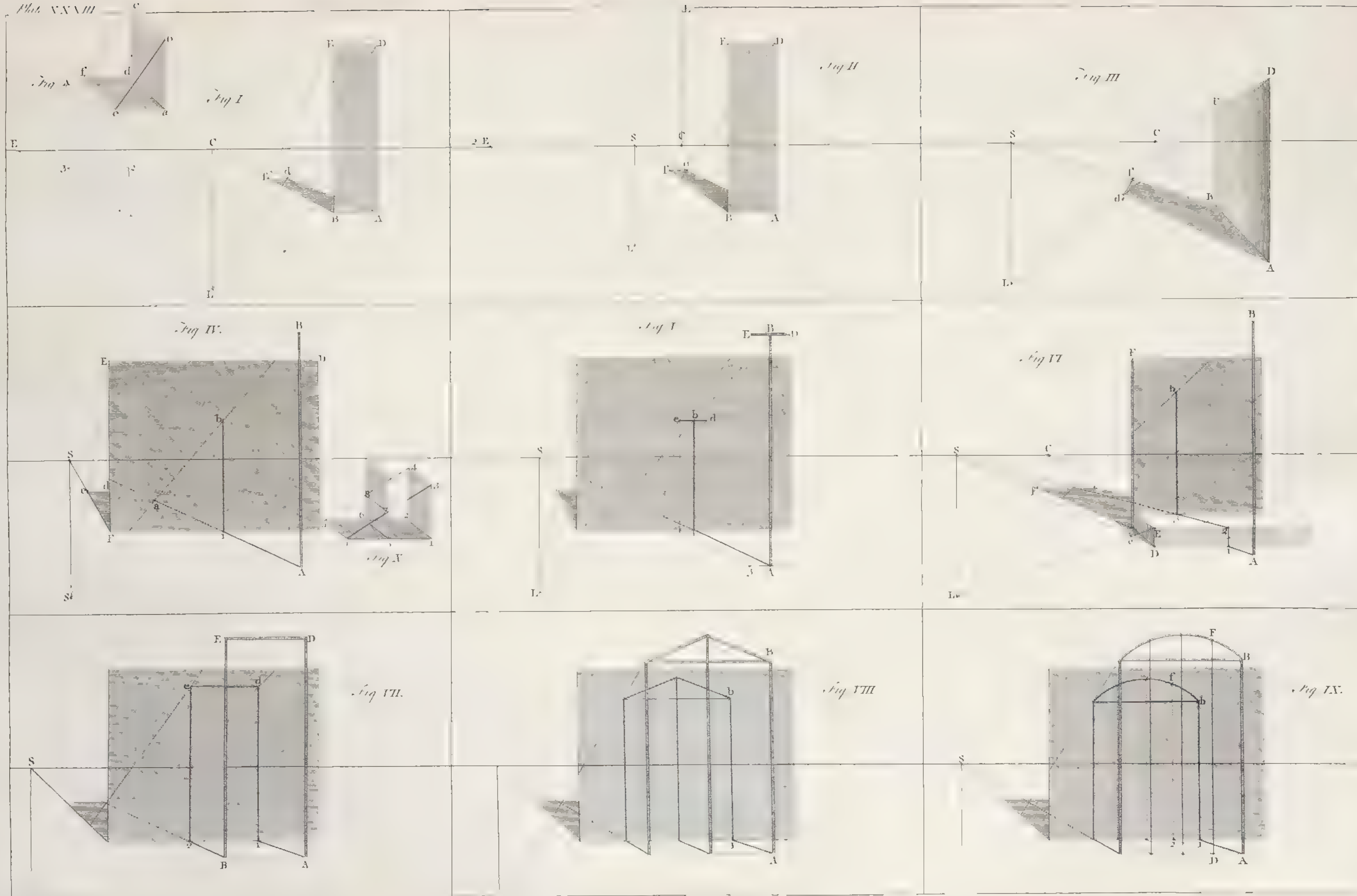
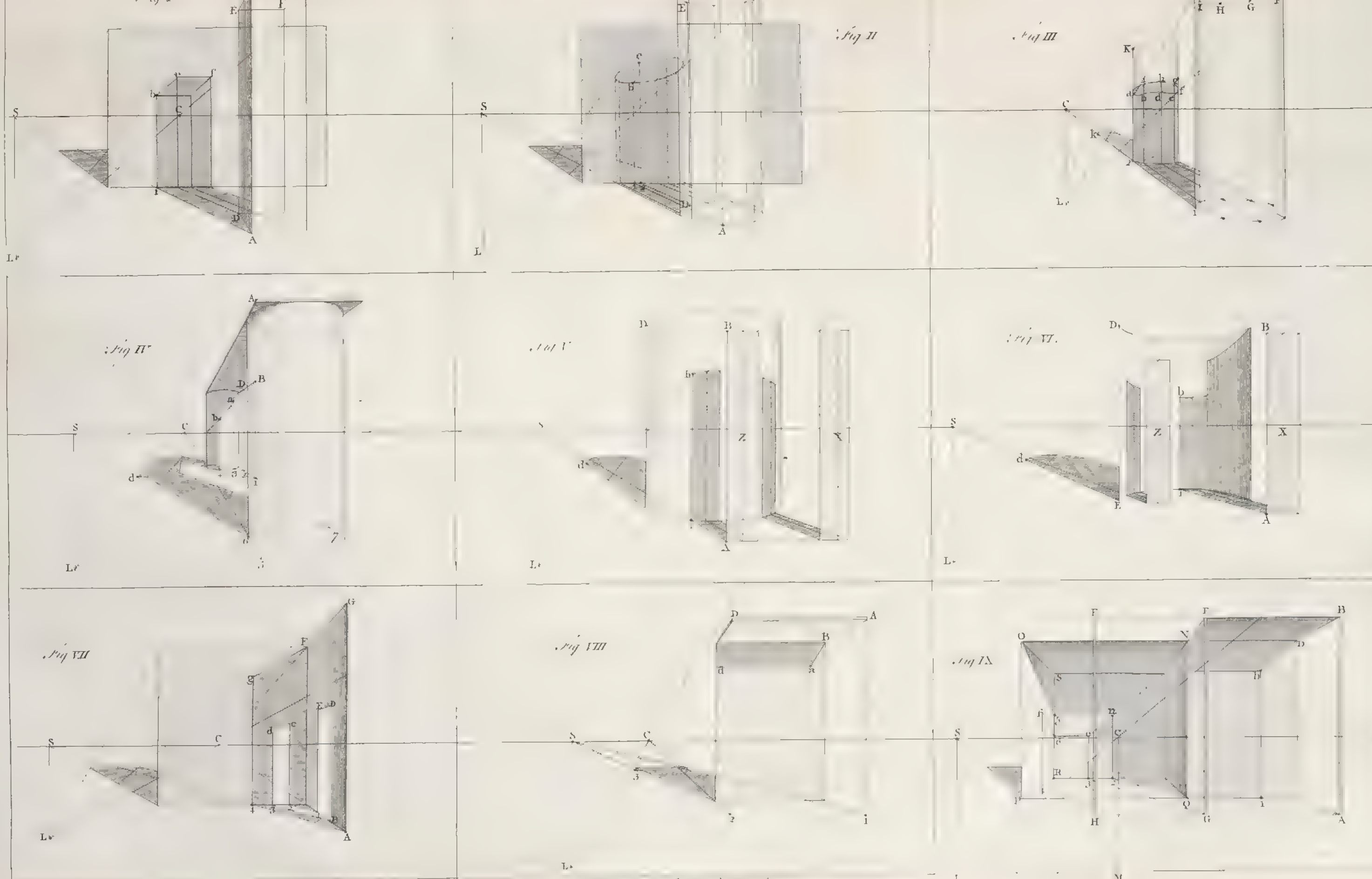


Fig. A
Fig. I
Fig. II
Fig. III
Fig. IV.
Fig. V
Fig. VI
Fig. VII.
Fig. VIII
Fig. IX.
Fig. X

Plate XXXII.



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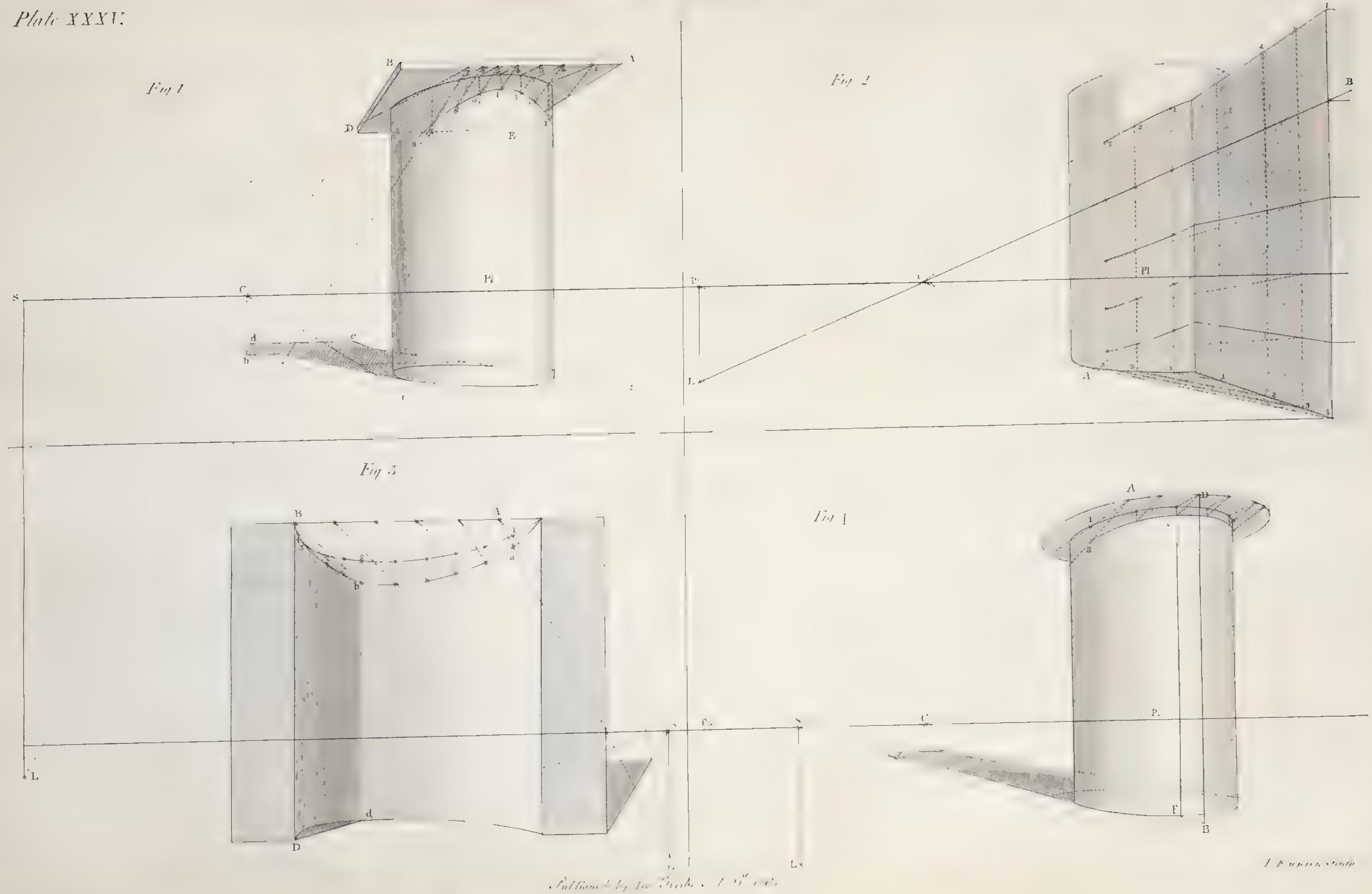

PLATE XXXVI

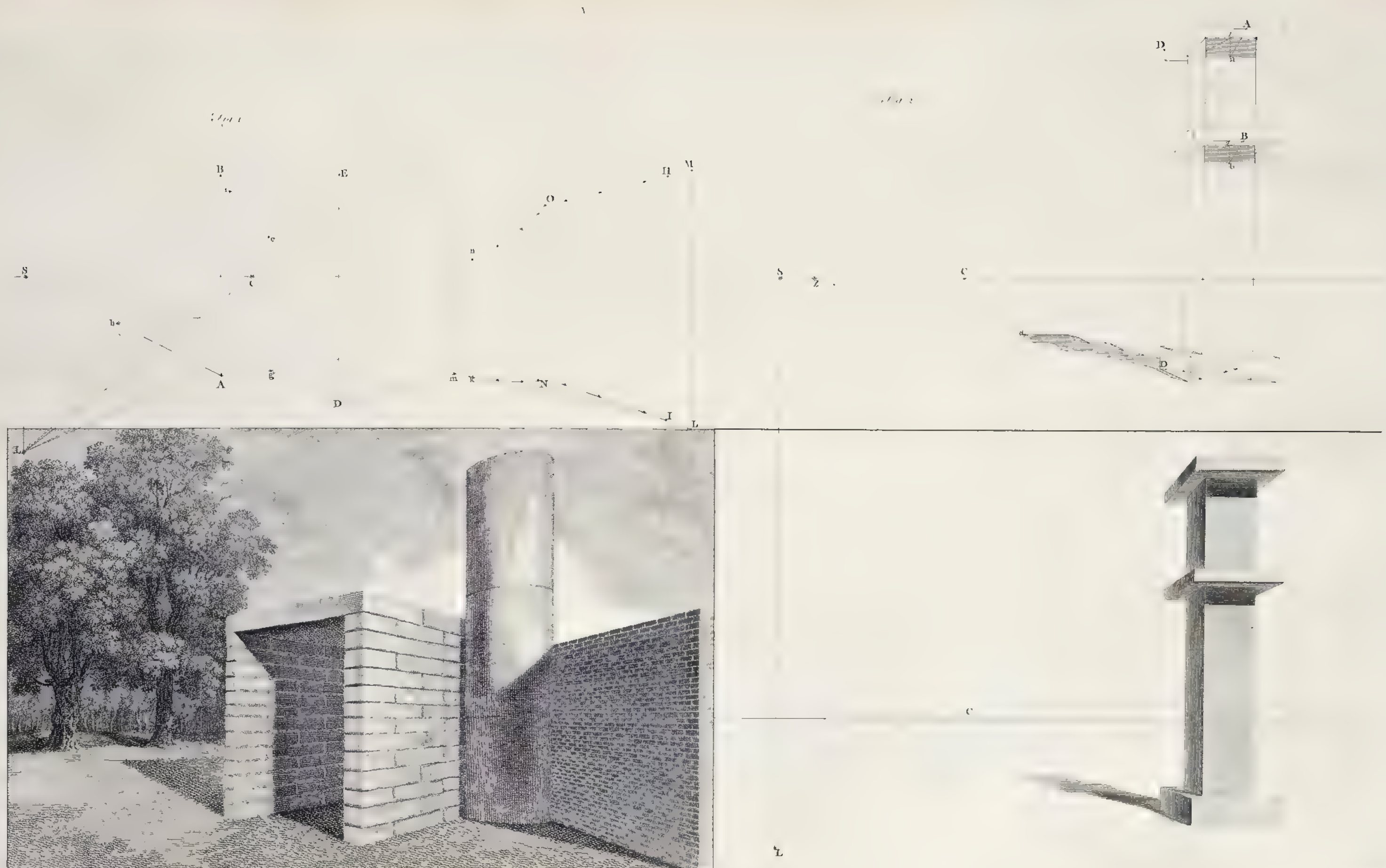

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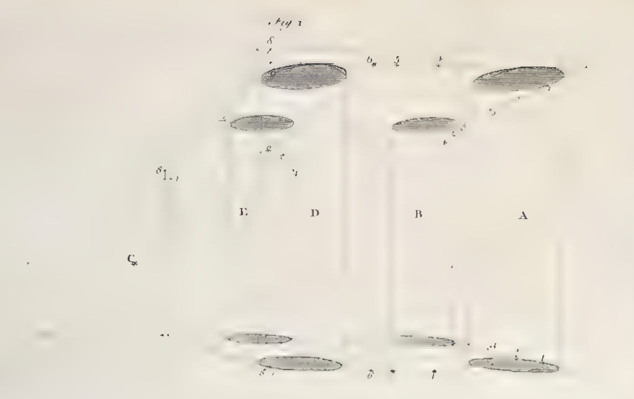
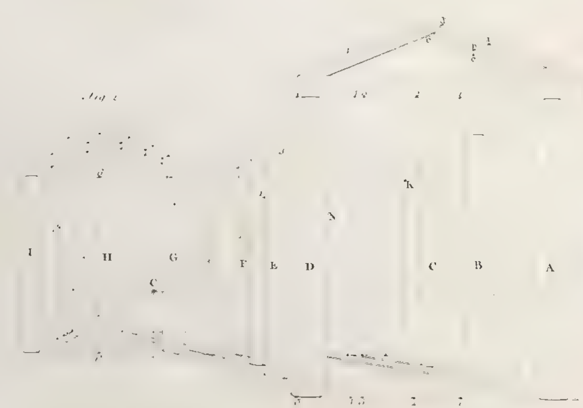
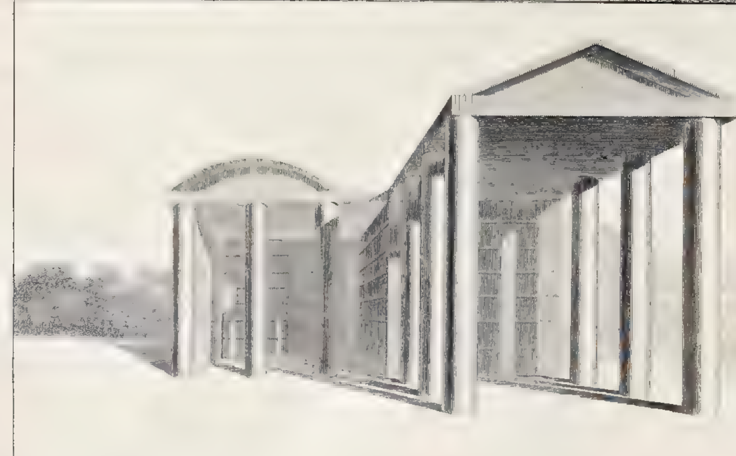
PLATE XXXII





L

M



J. Walker sculp.

Plate XXXVIII.

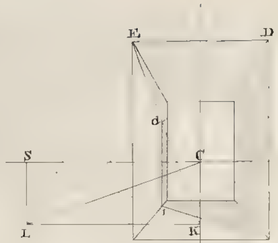


Fig. 1

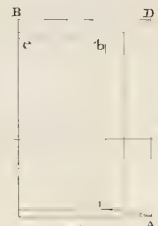
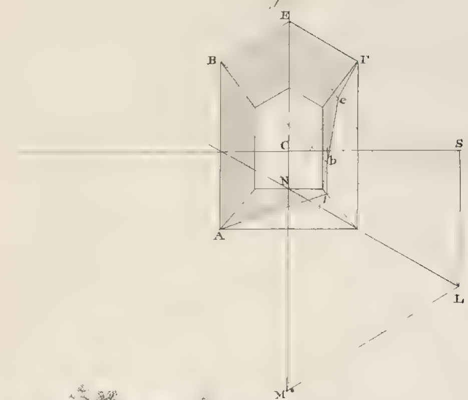
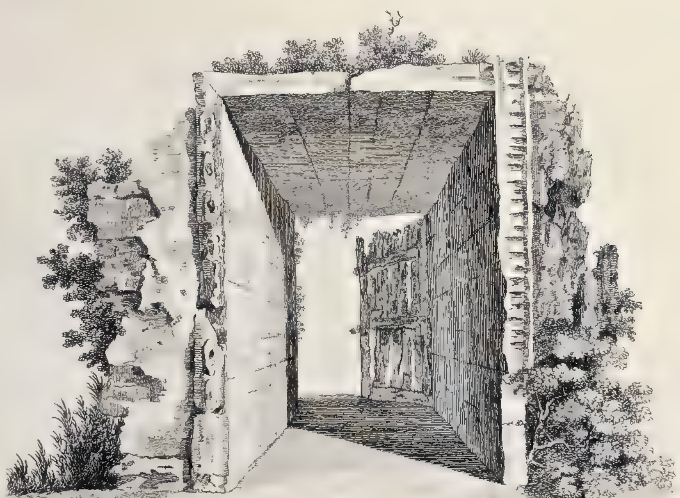


Fig. 2

Fig. 4.

Fig. 3





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Kirby Jun. Sculp.

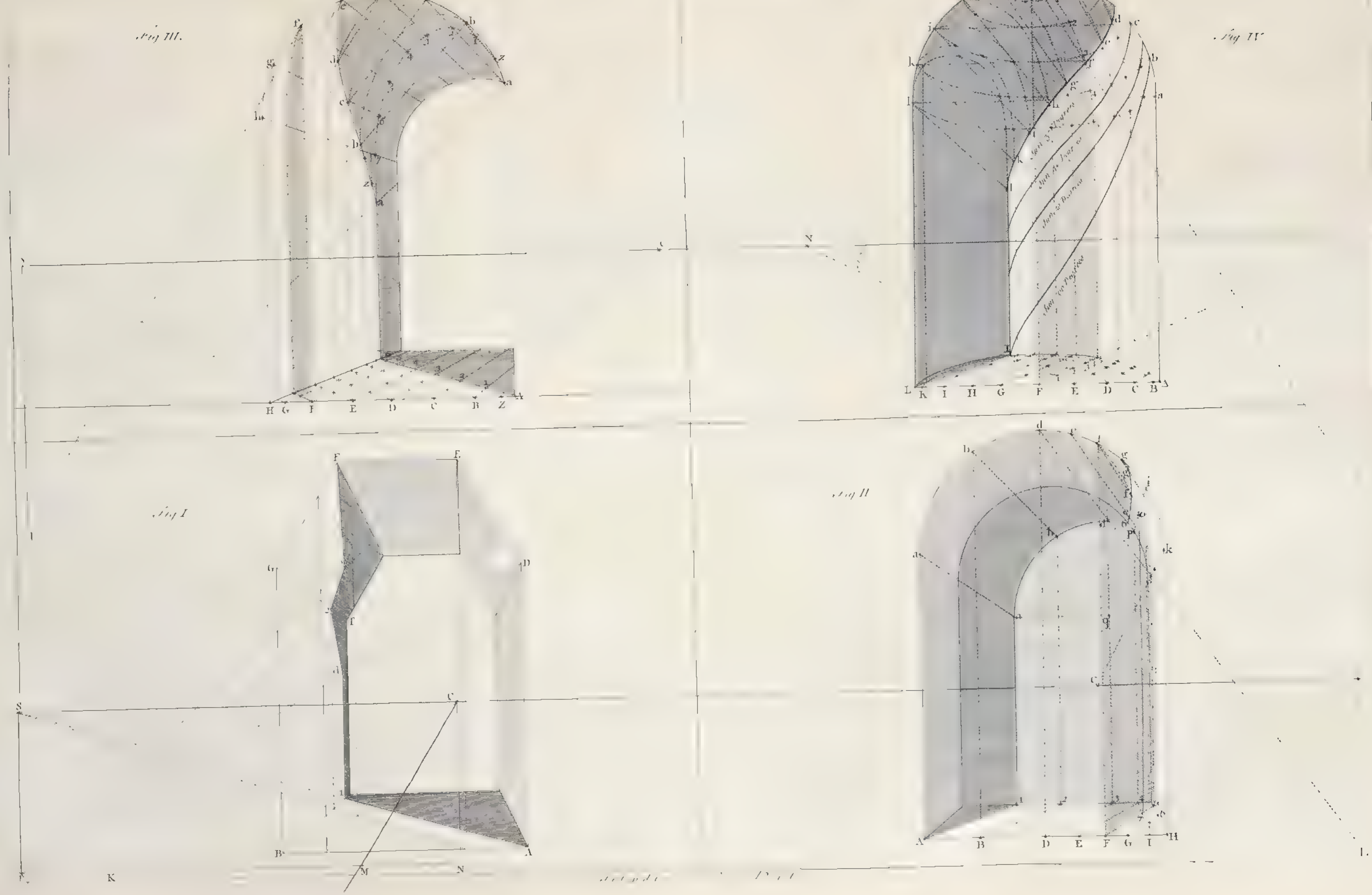
Fig. III.
Fig. IV.
Fig. I.
Fig. II.

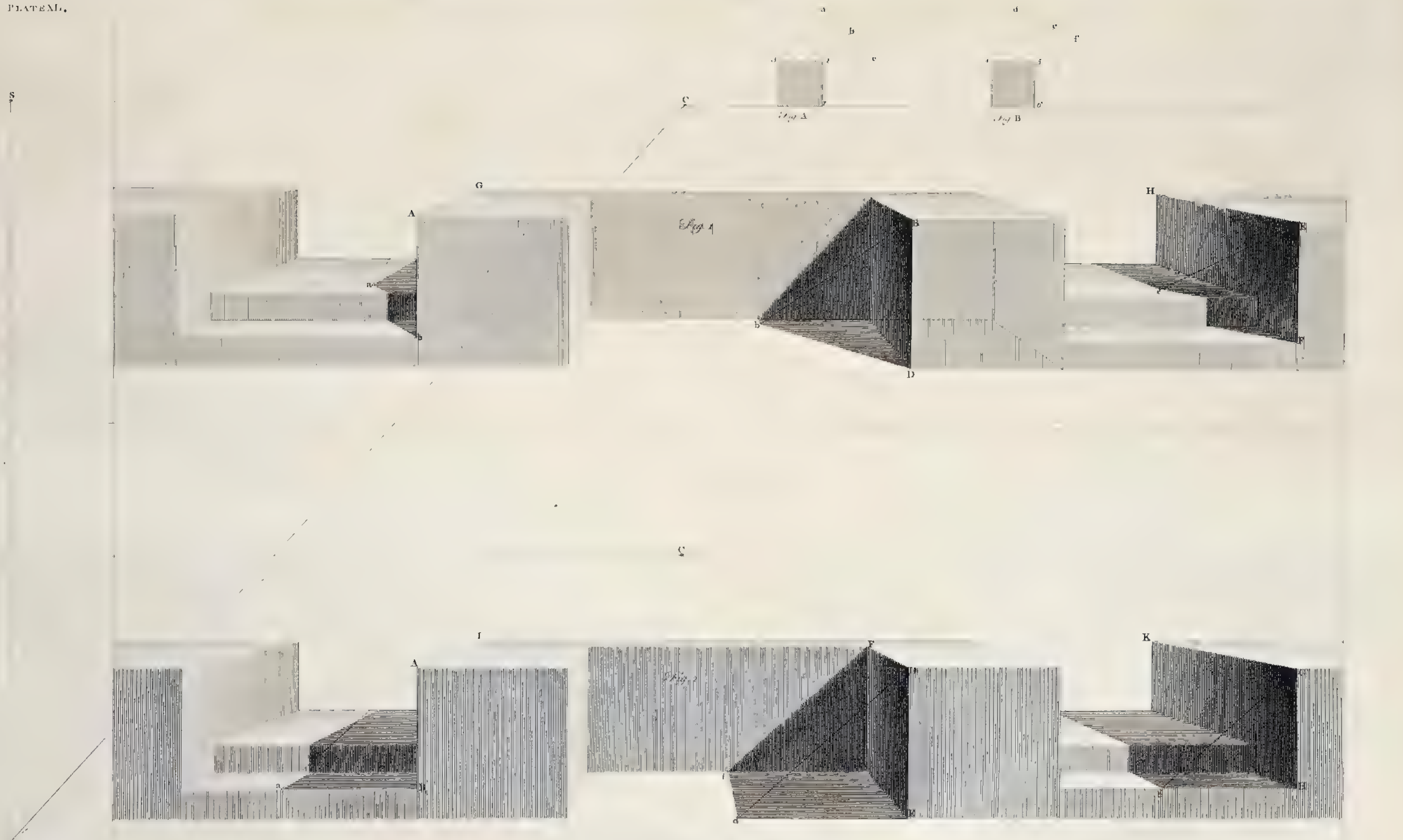

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Plate XLI.

Fig. 1

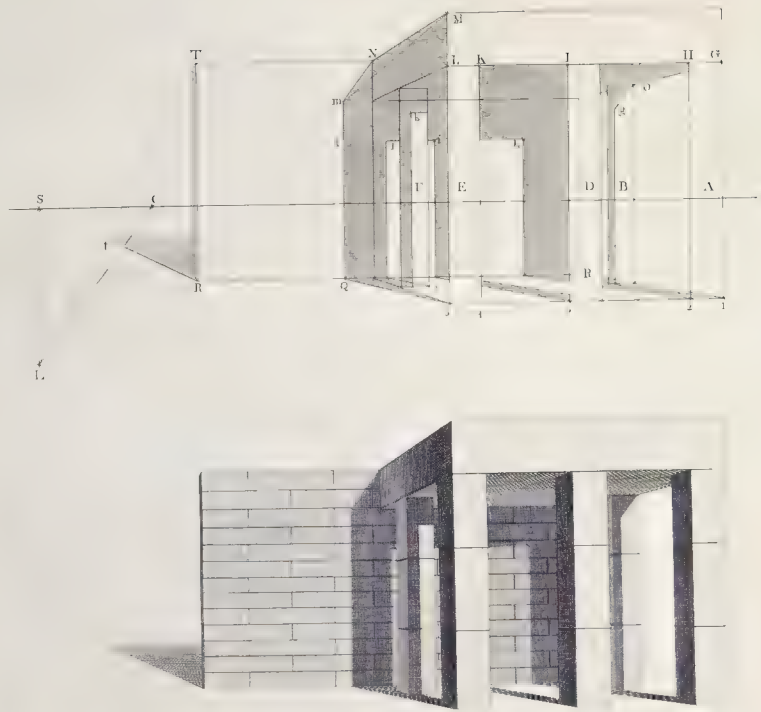


Fig. 2

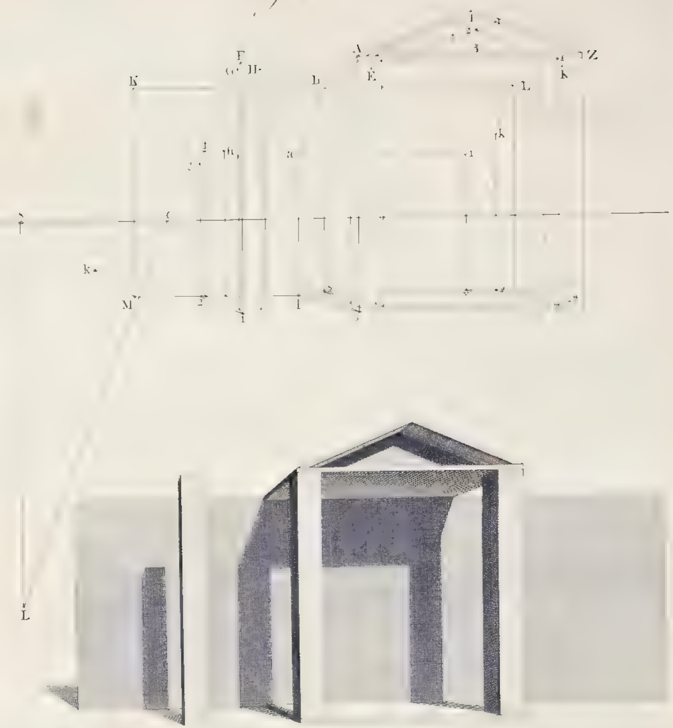
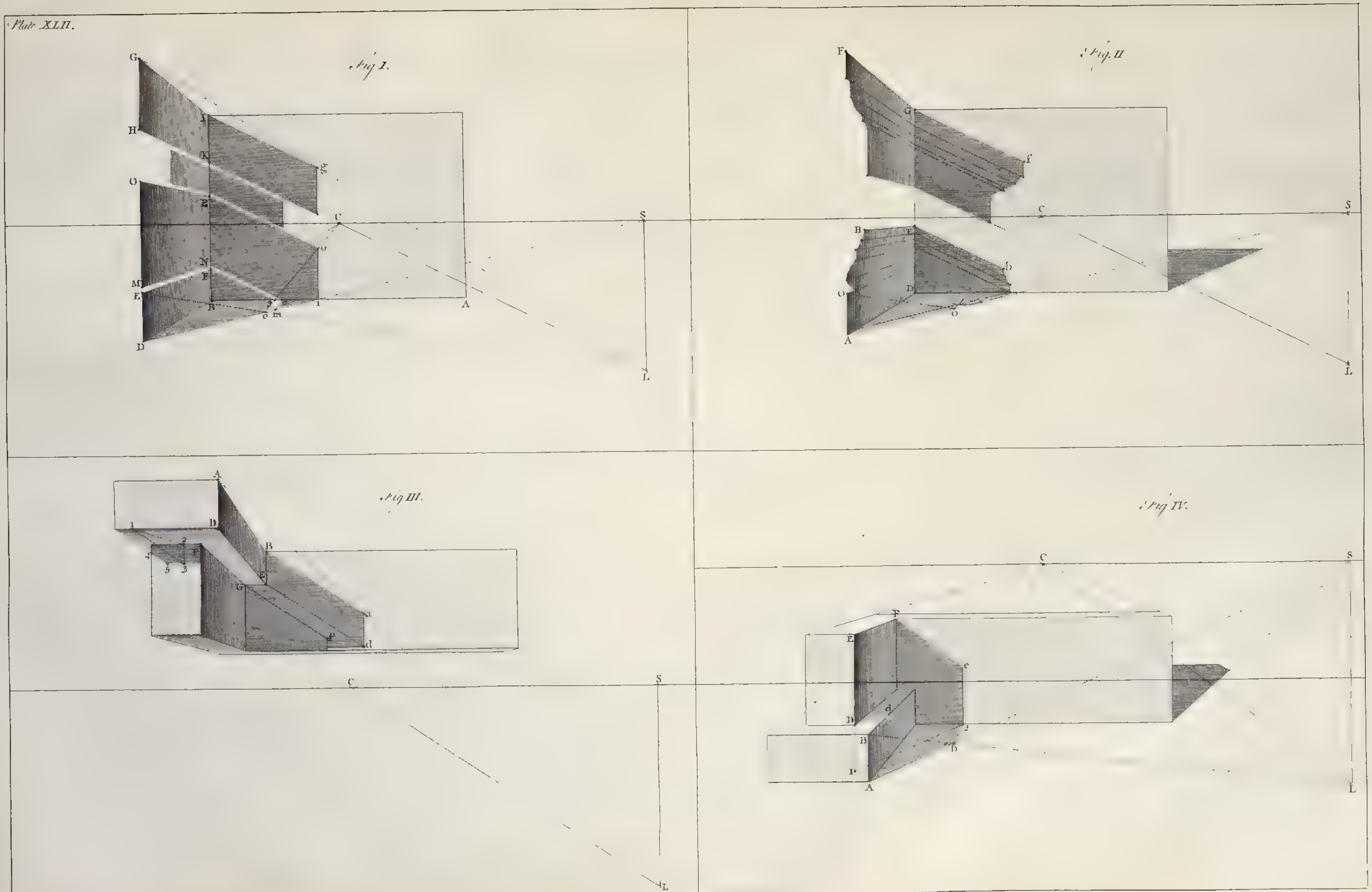


Plate XLII.



Published by Josh. Kirby Feb. 2d 1761

Plate XLIII.

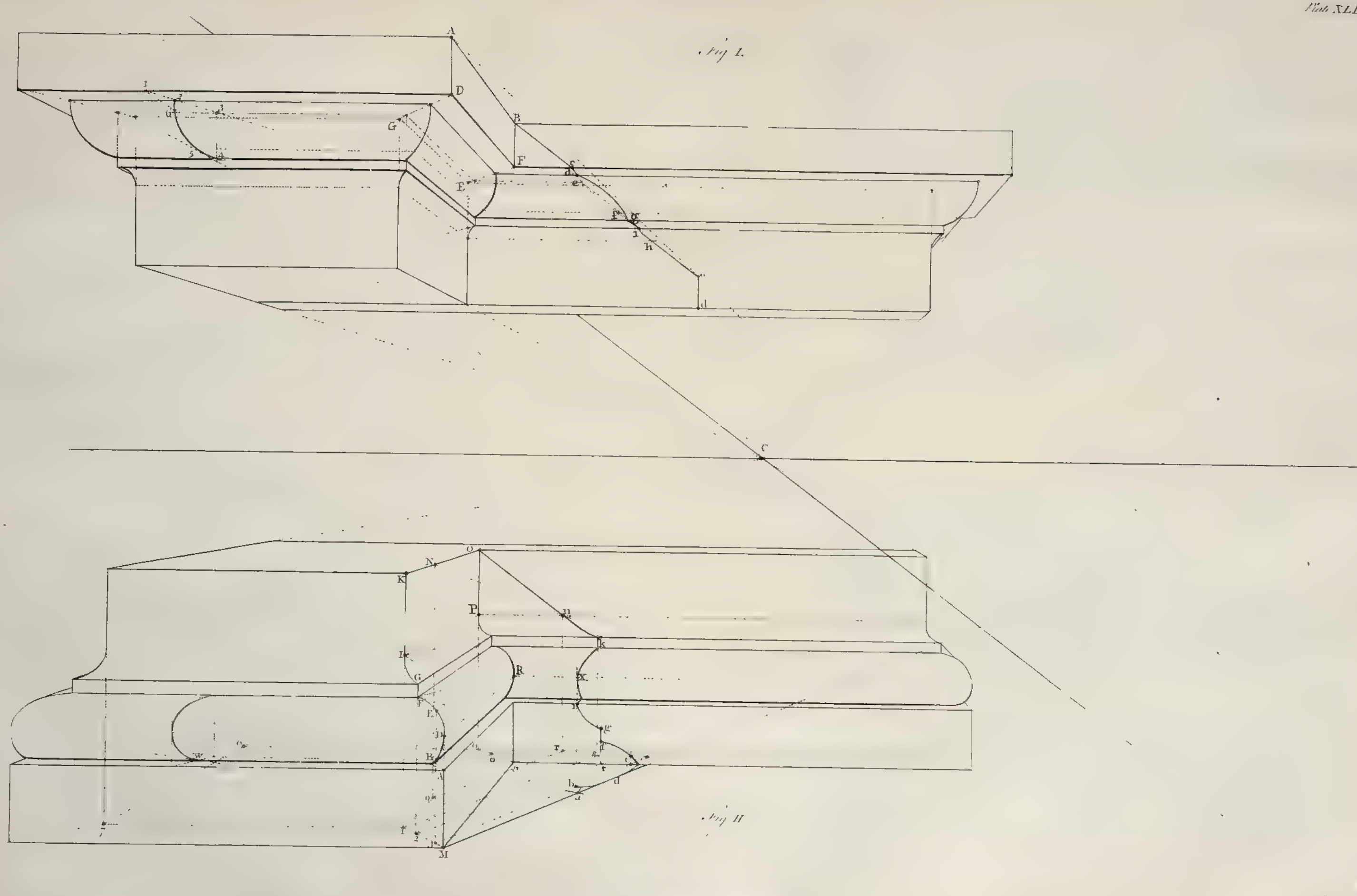


Fig. I.

Fig. II

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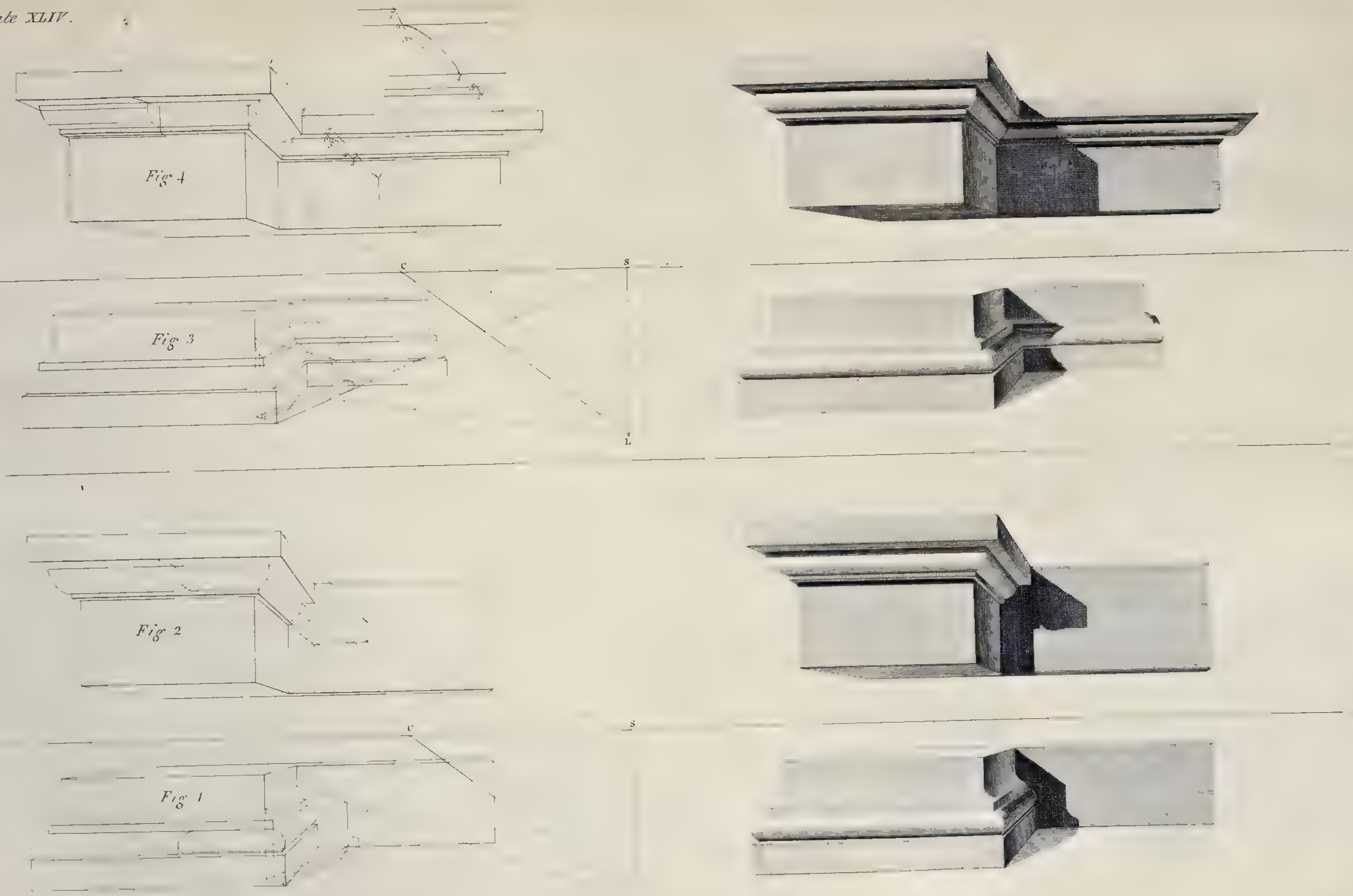
Plate XLIV.



Published by Jos. Kirby Feb. 2d 1761

Patton Sculp.

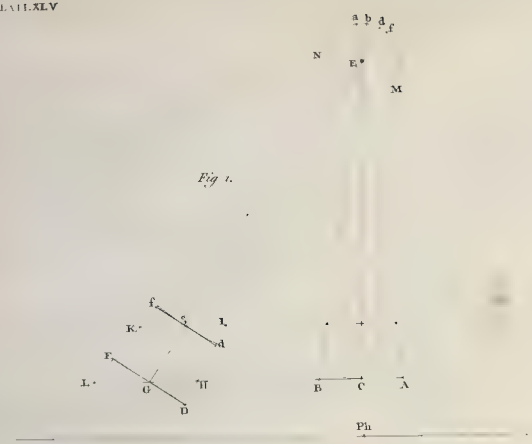


Fig. 1.

Fig. 2

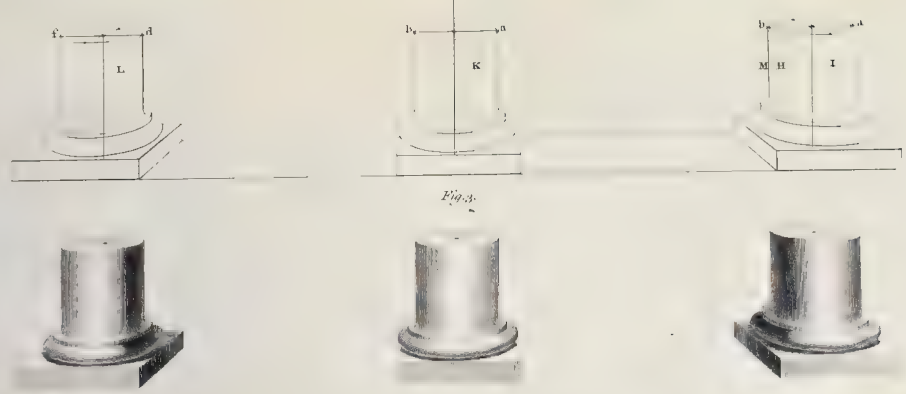


Fig. 3.

A. Walker sculp.

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Plate XLVI.

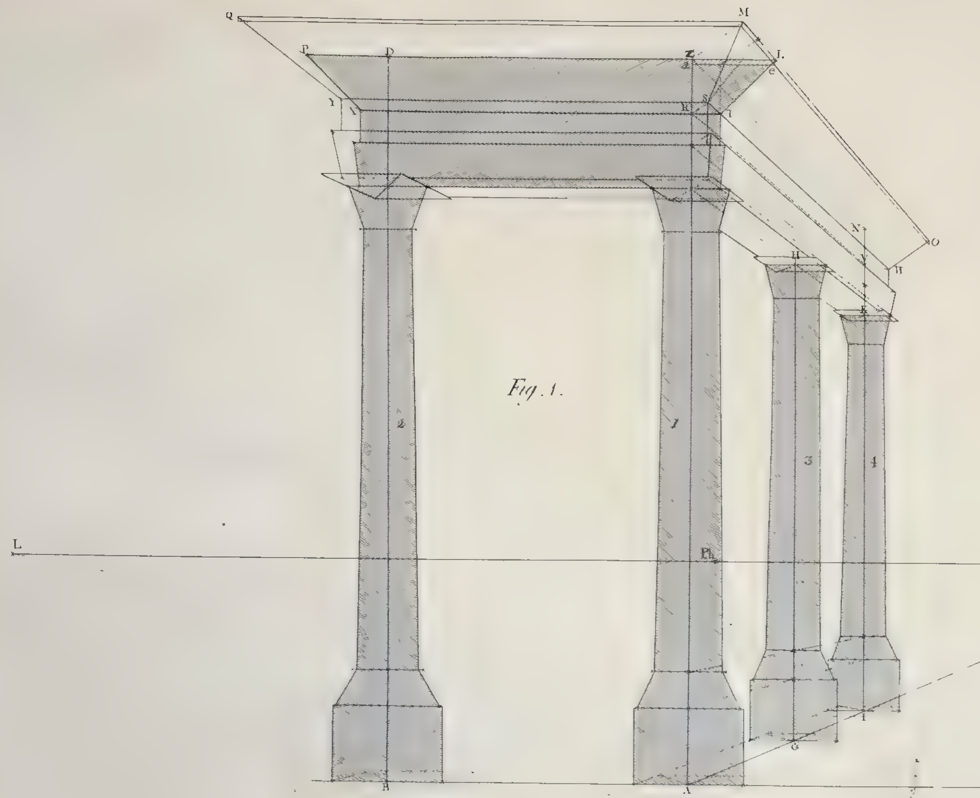

Fig. 1.

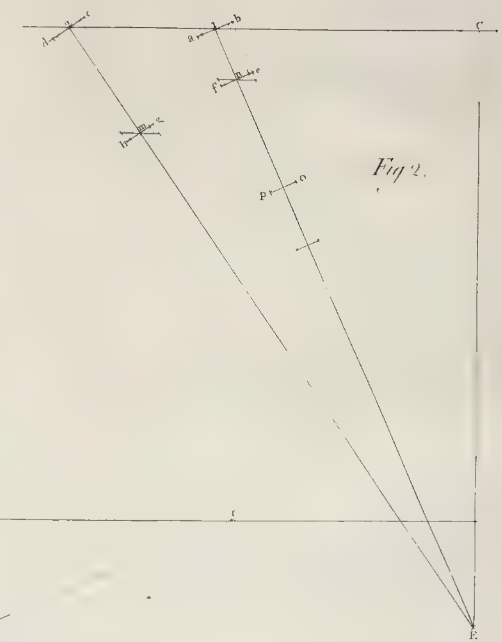

Fig. 2.

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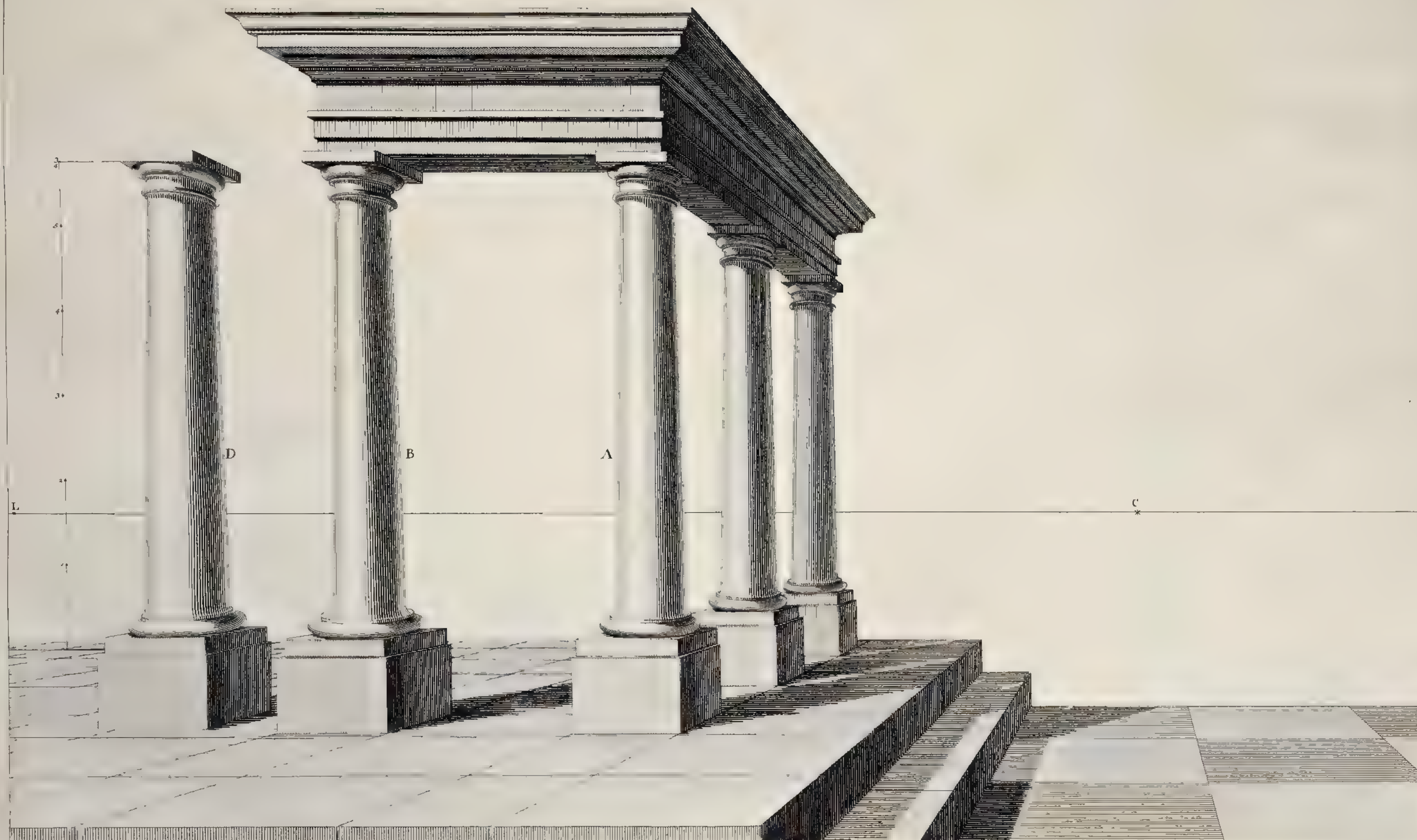
Plate XVIII.



F. Patton Sculp.

Plate. XLVIII

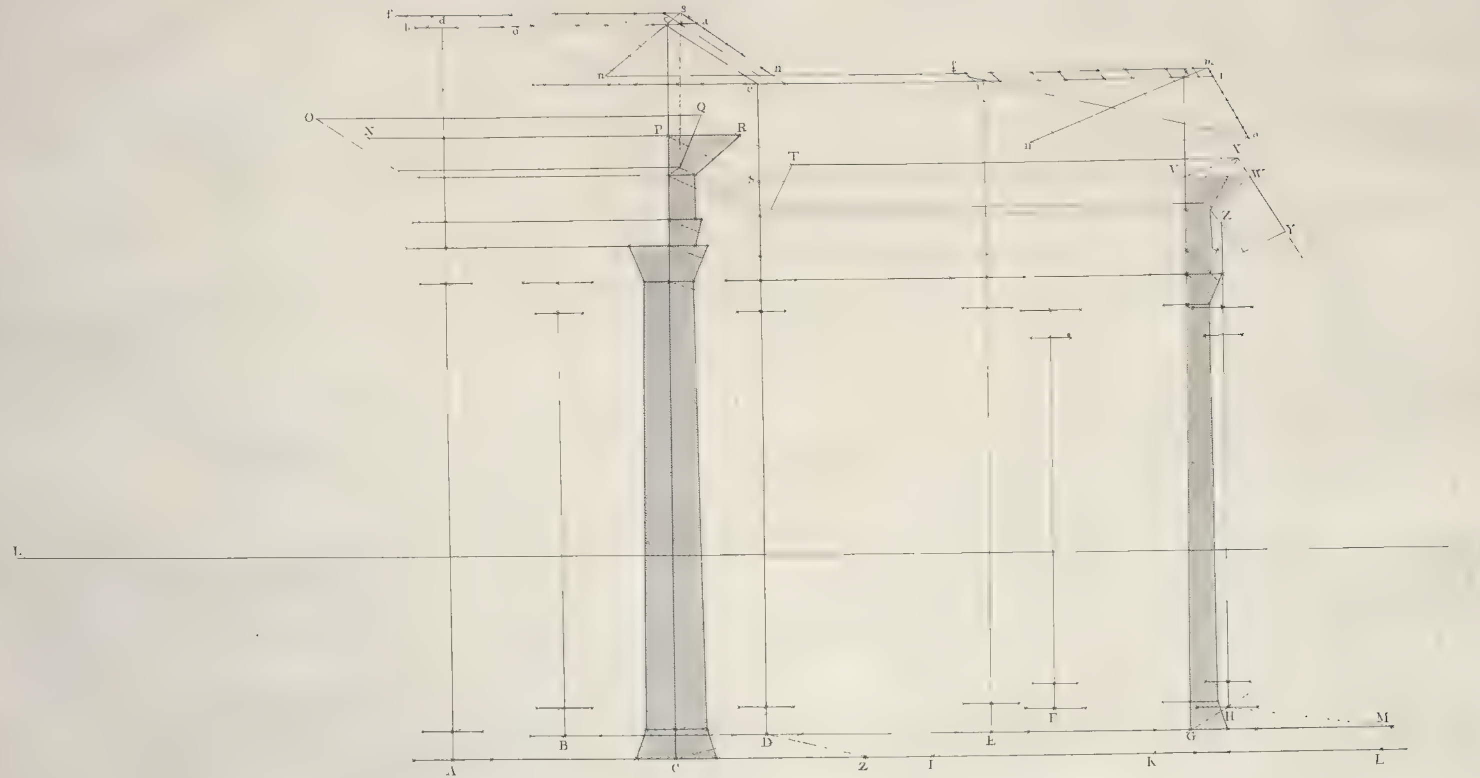


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Plate XIX.

Fig 2

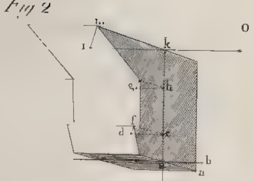

Fig 1

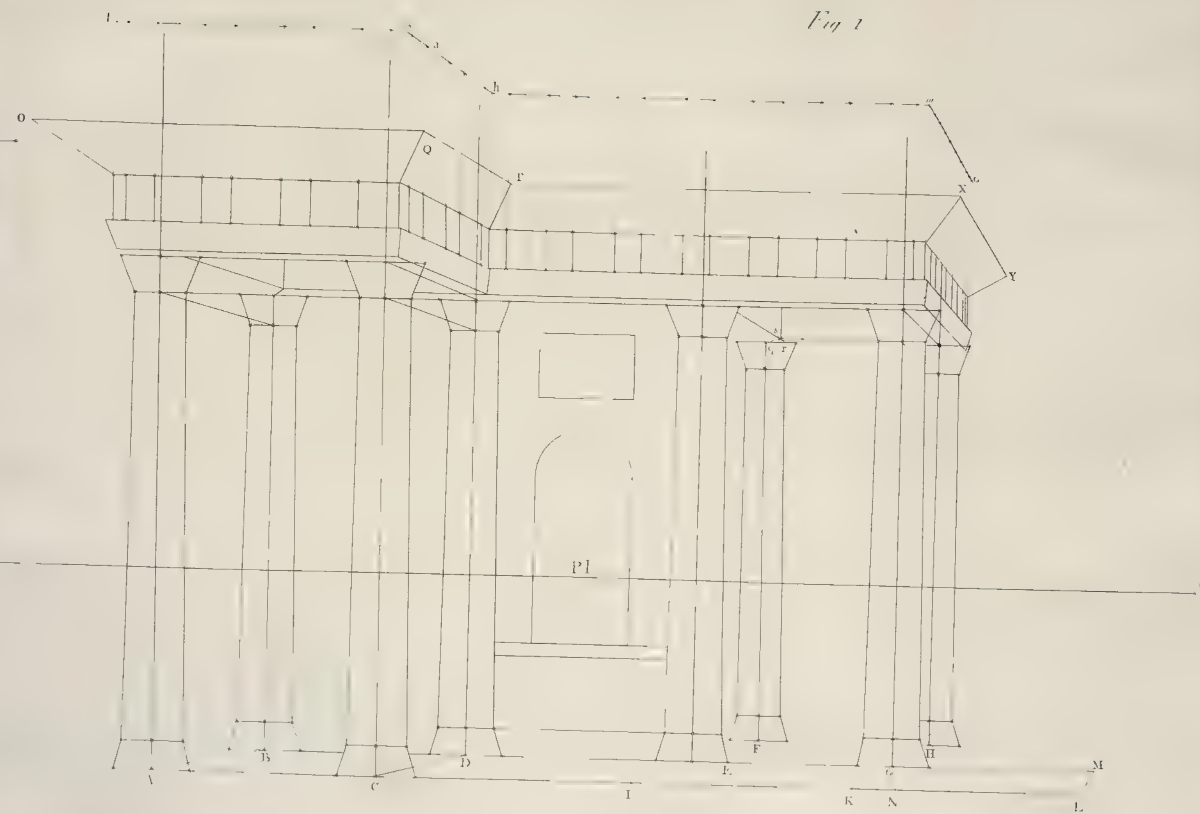

Plate I.

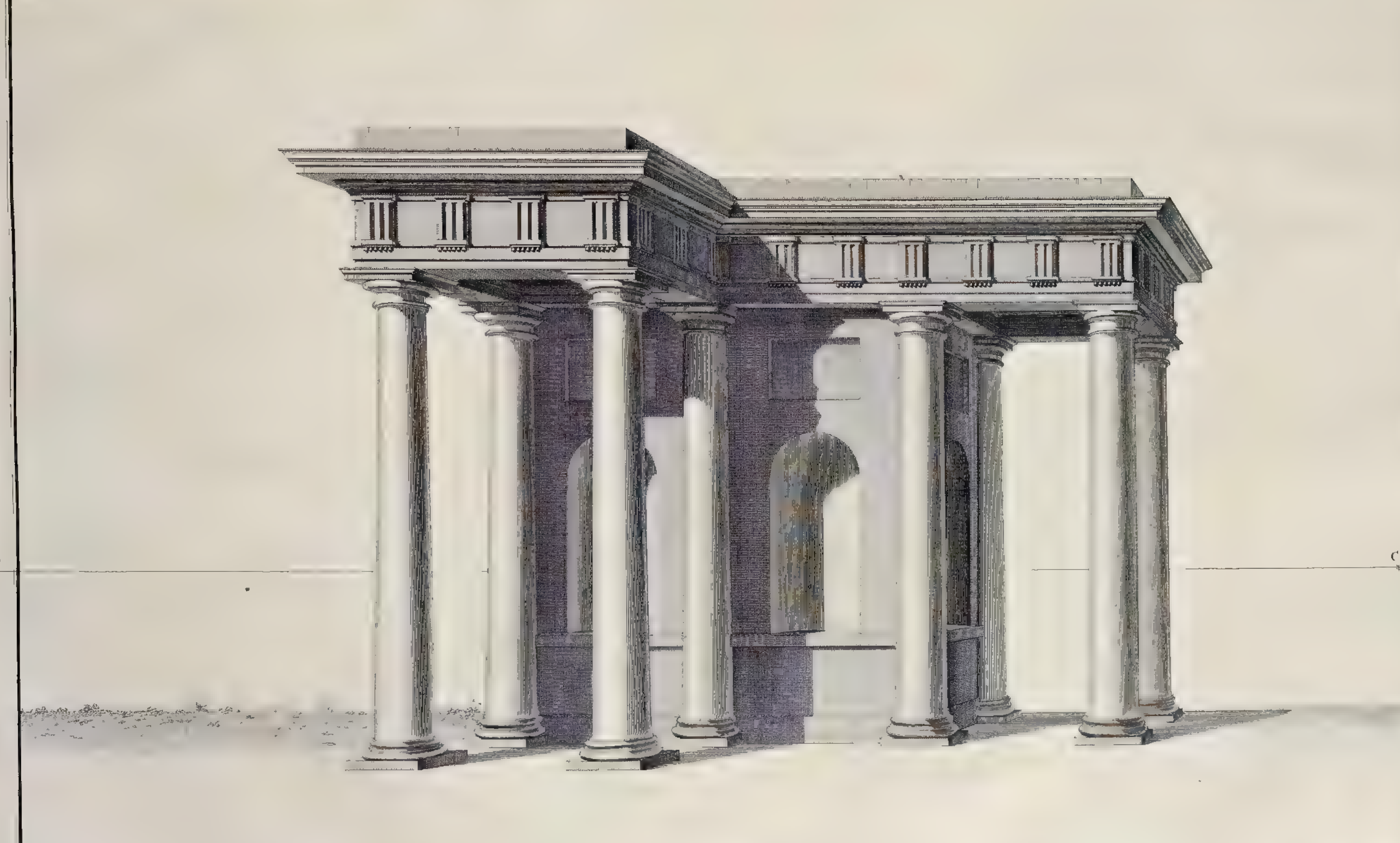

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Plate LI.

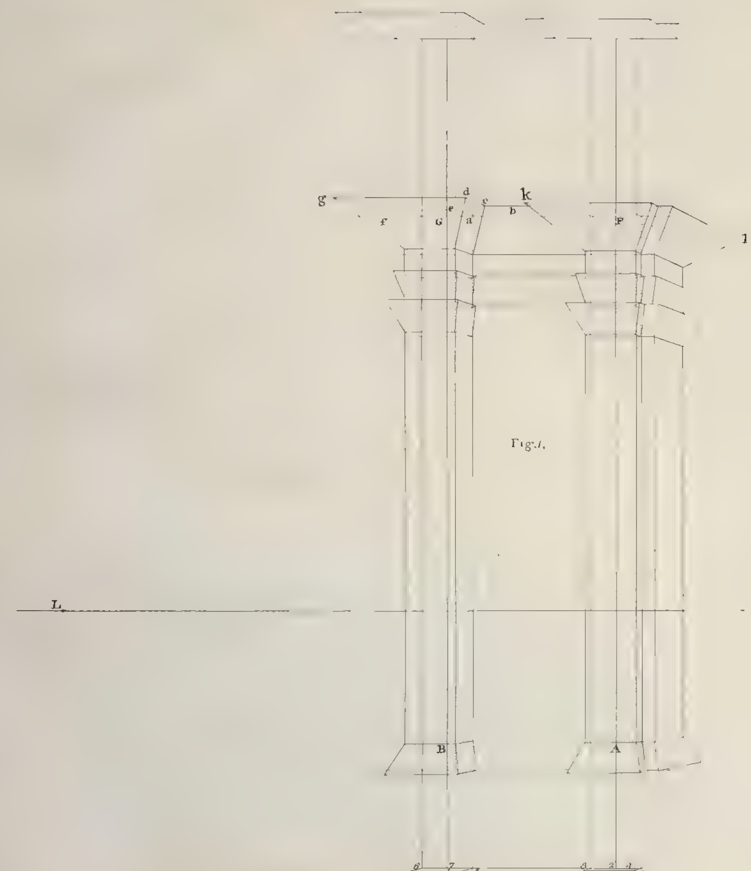
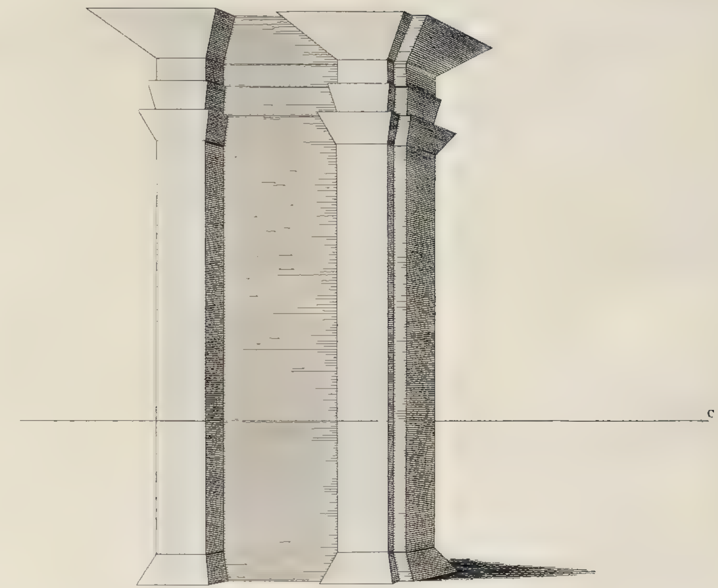


Fig.1.

Fig.2.



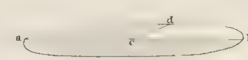


Fig.B.

Fig. A

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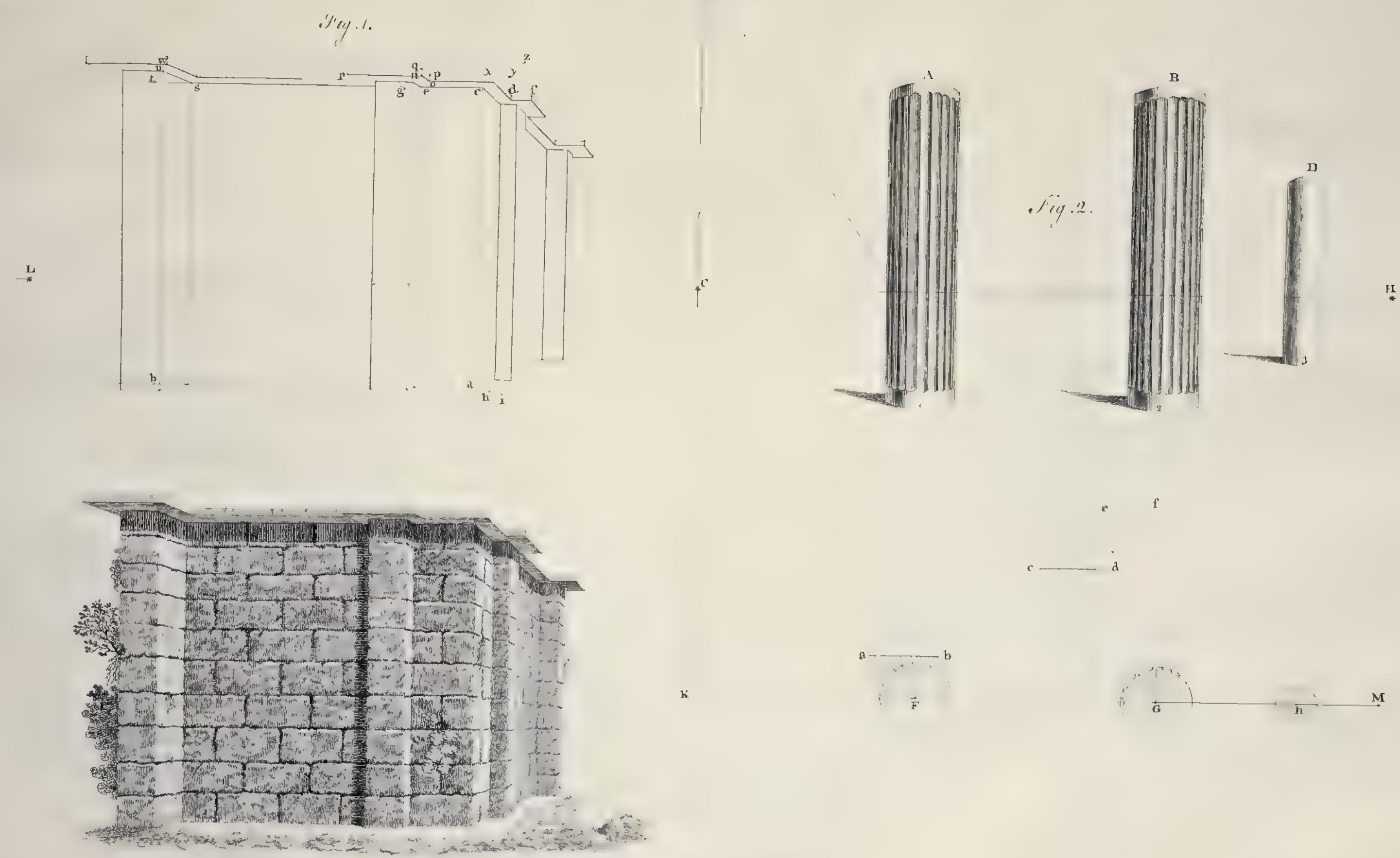
Plate III.



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Kirby jun. Sculp.

Plate LIII.

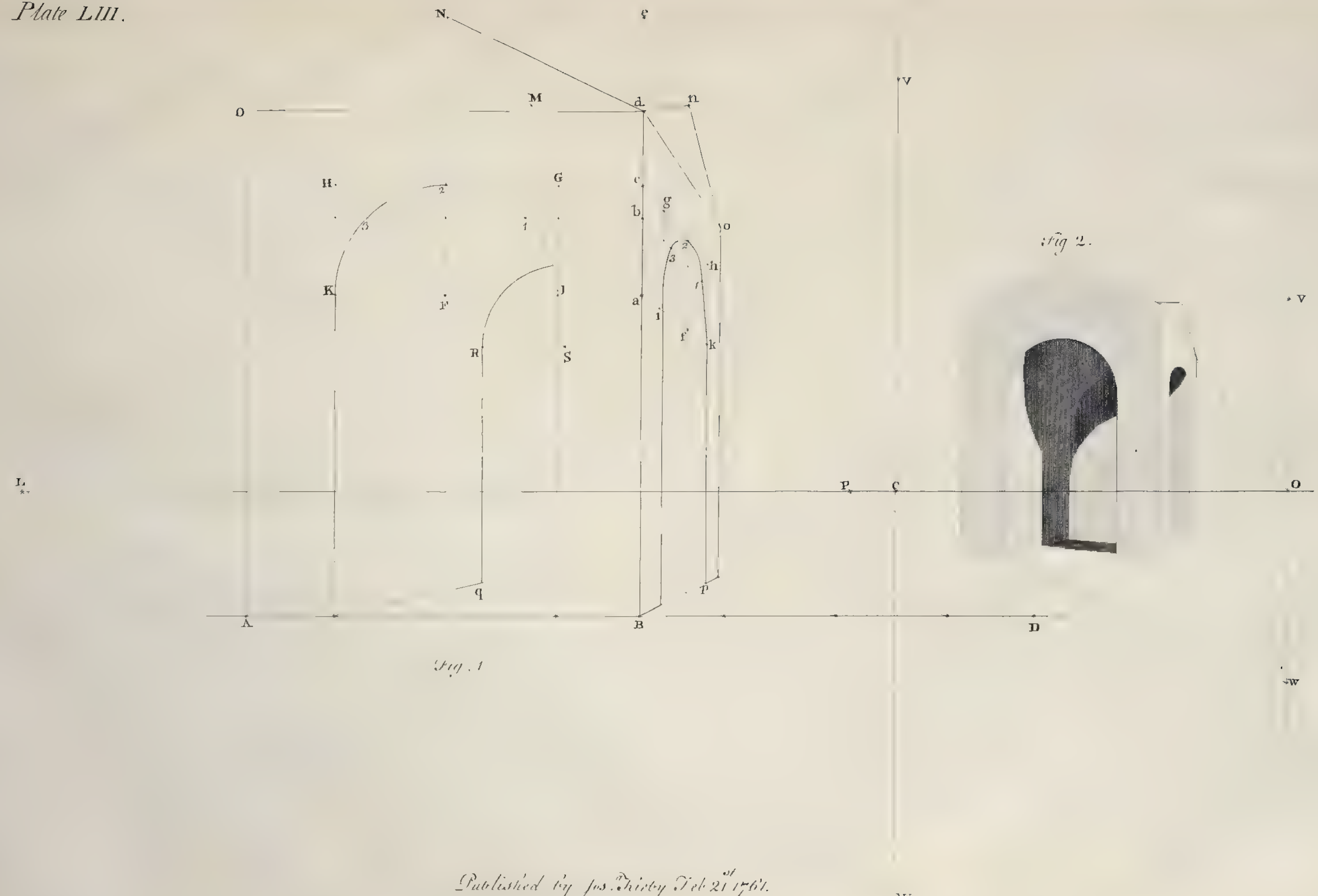

Fig. 1

Fig. 2.

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Plate LIV.

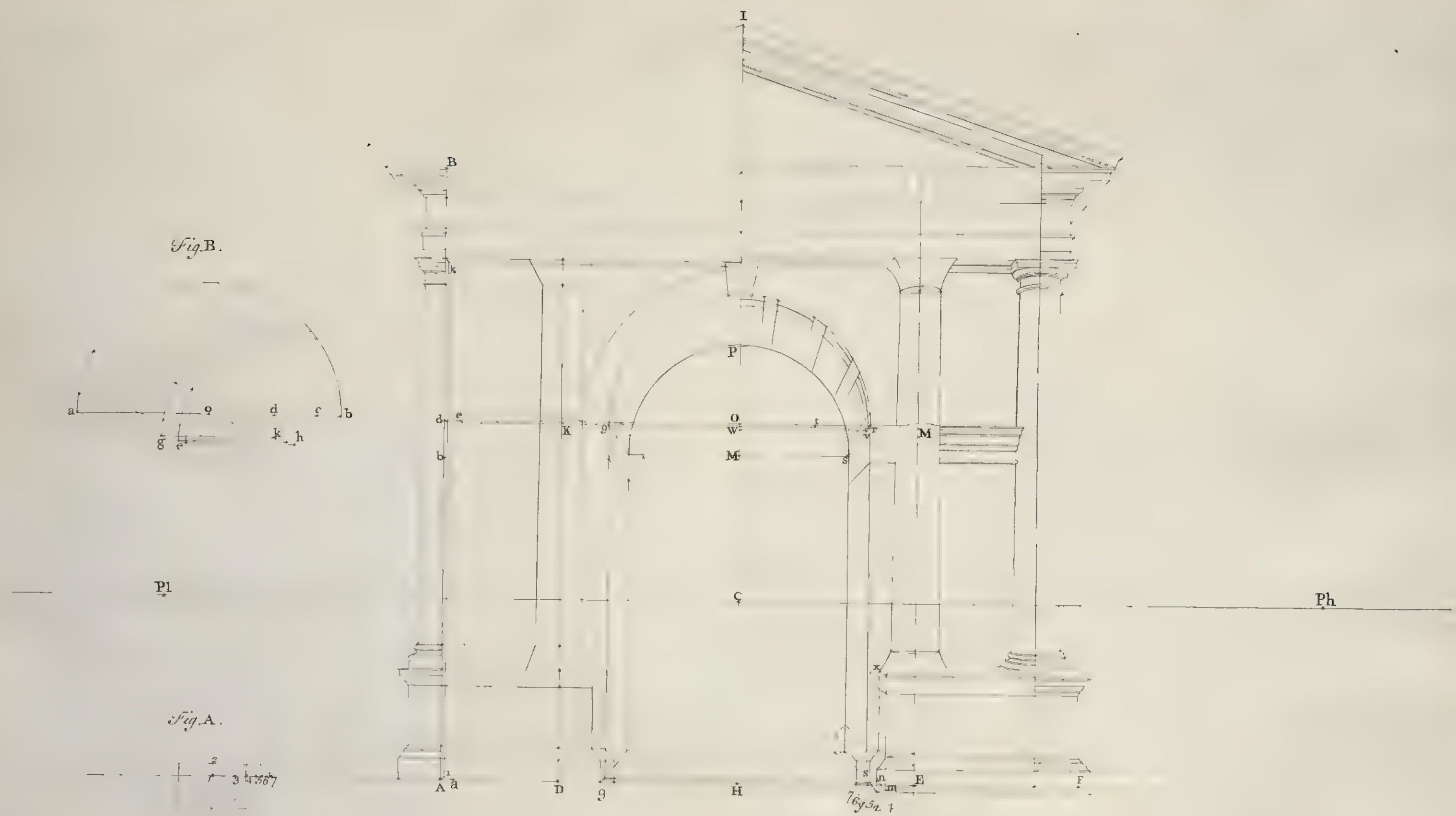

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Plate IV.

To Mrs. Younge, Daughter of Dr. Brook Taylor; This Plate as a Tribute Due to her Father's Merit, is Dedicated, by Her unknown, but Most Respectfull humble Servant, Joshua Kirby.

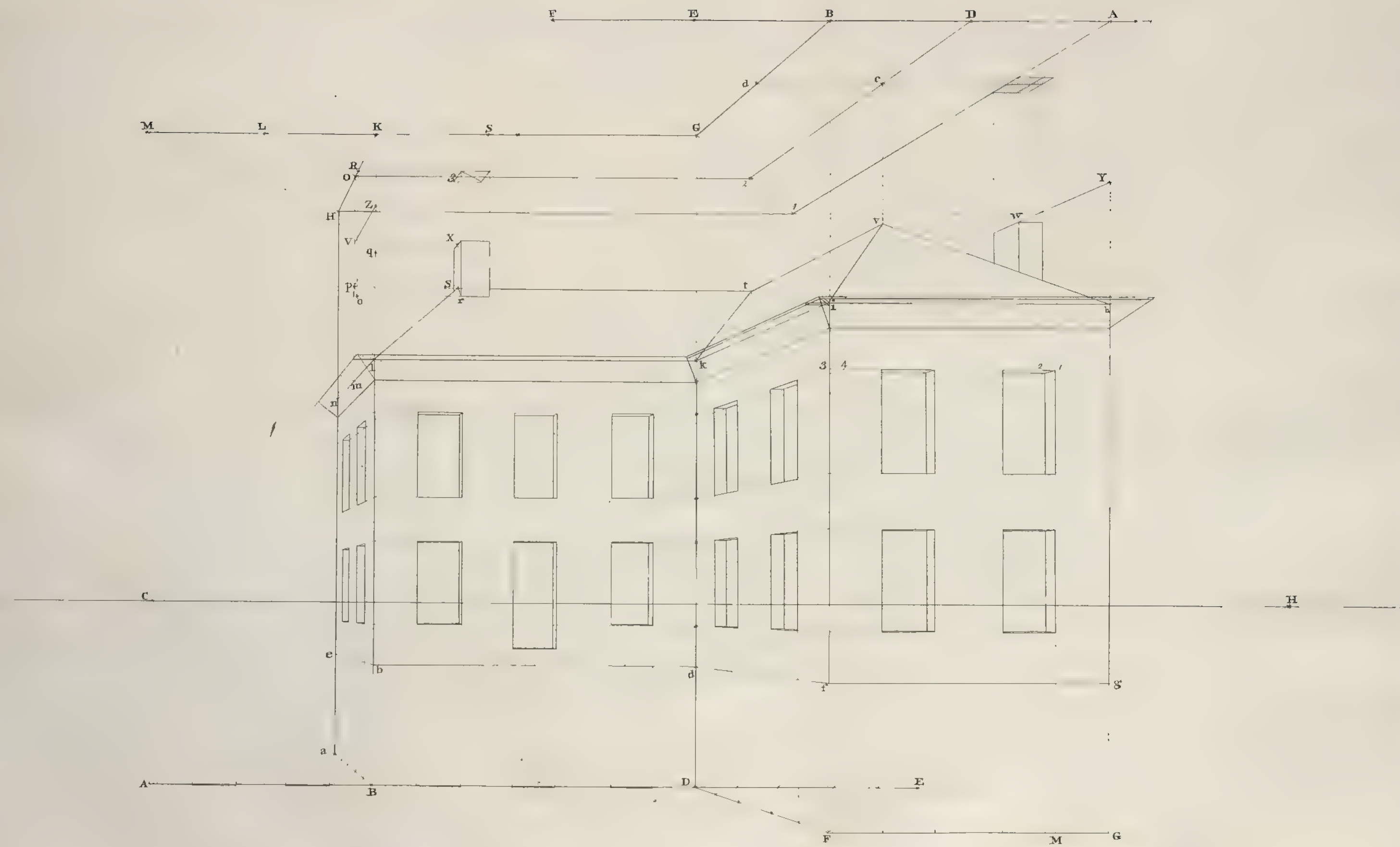

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Plate LVII

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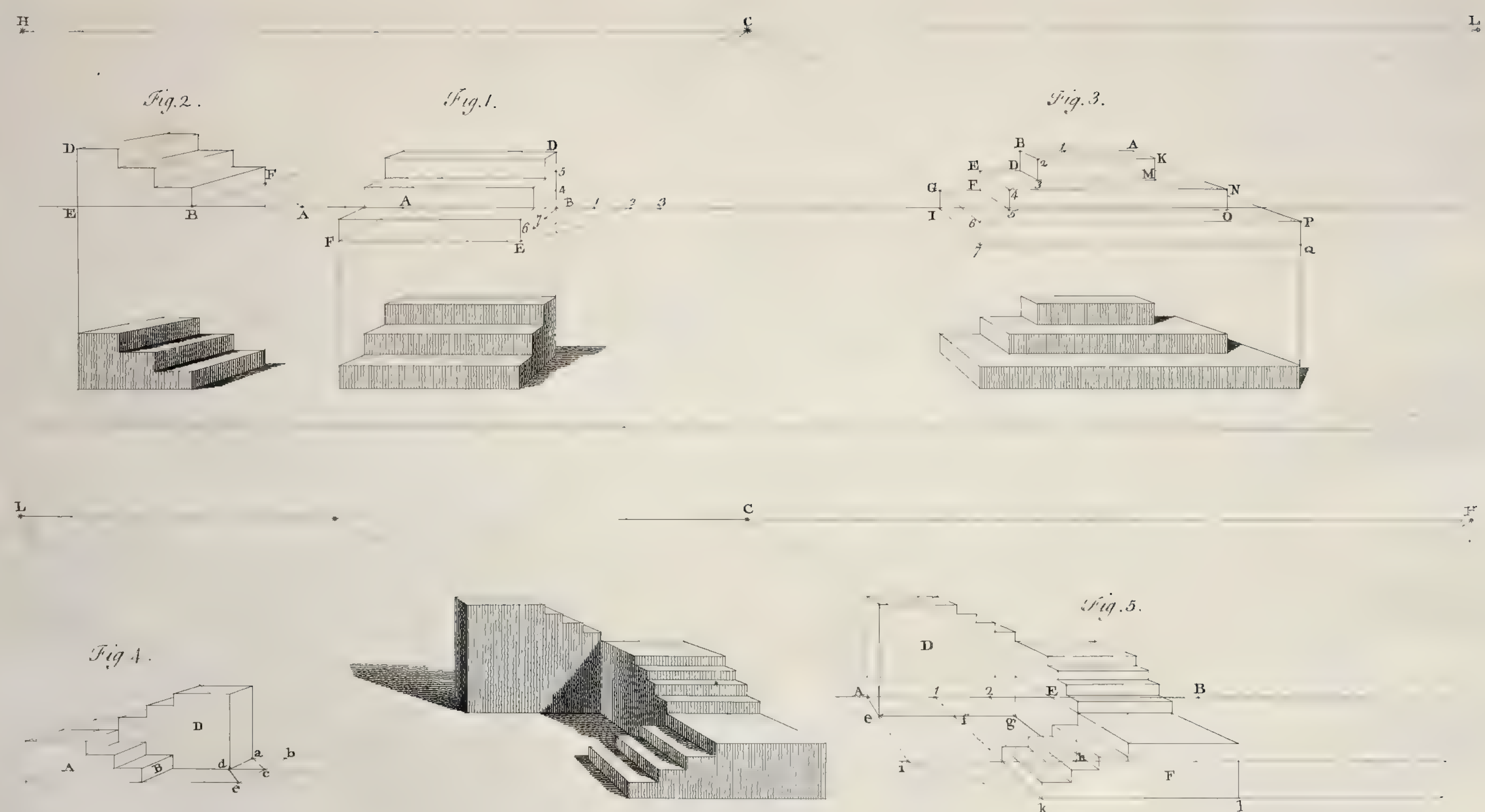
J. Patton Sculp.

Plate LVIII.



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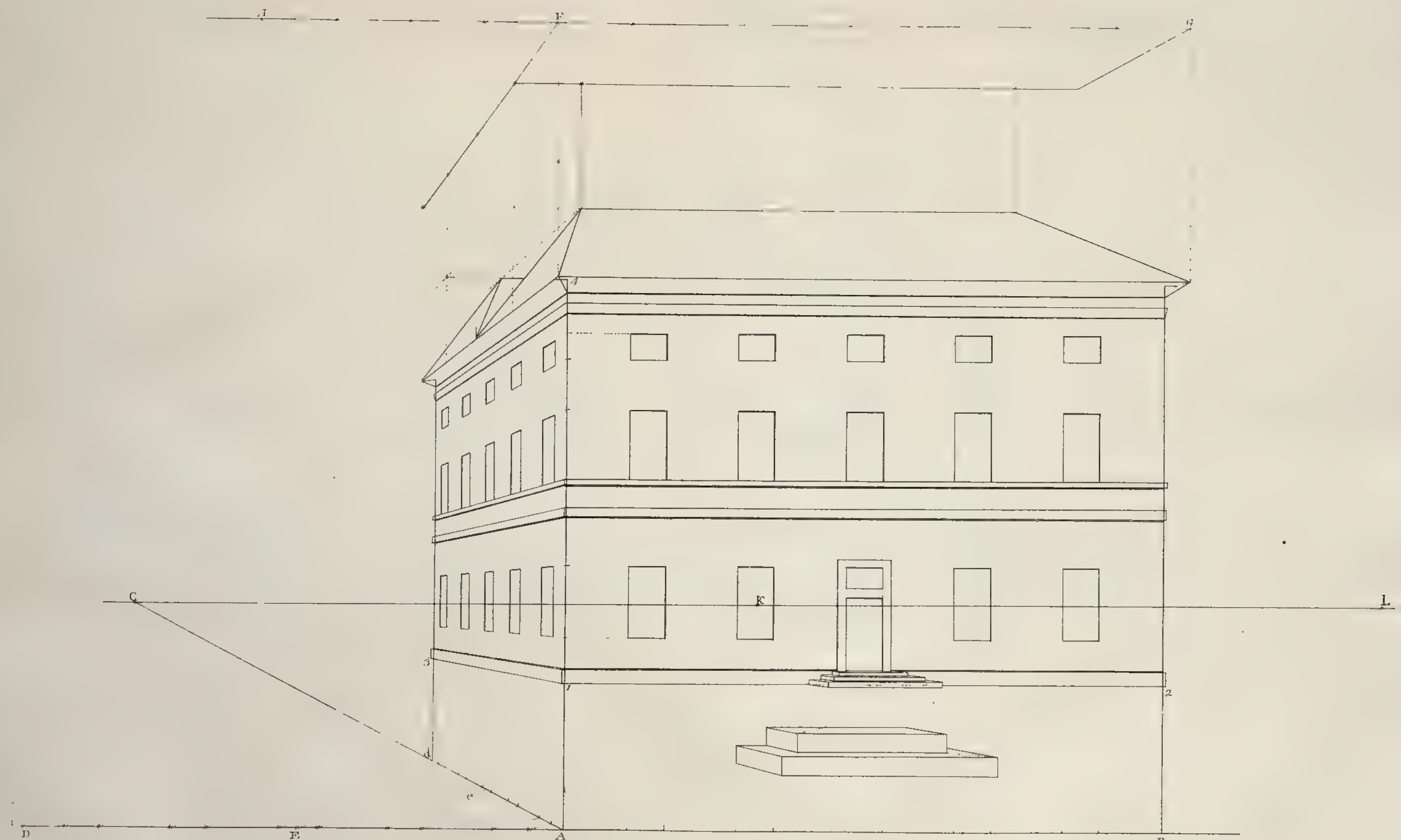
J. Ryland Sculp.

Plate LIX.



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Plat. LX.

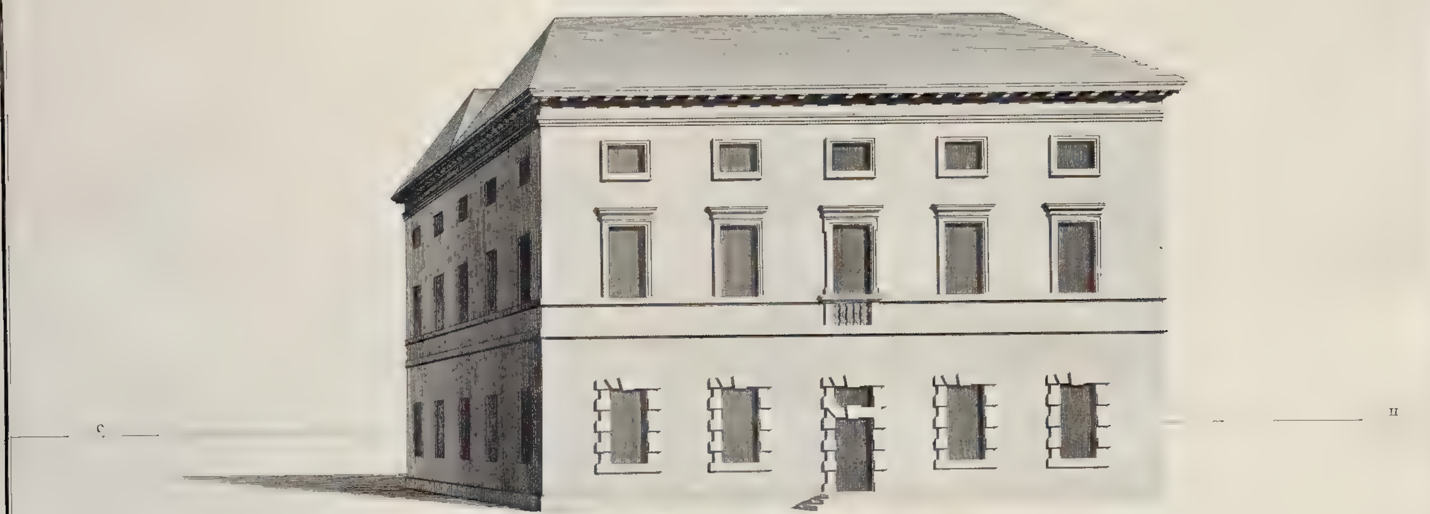

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Plate LXI.

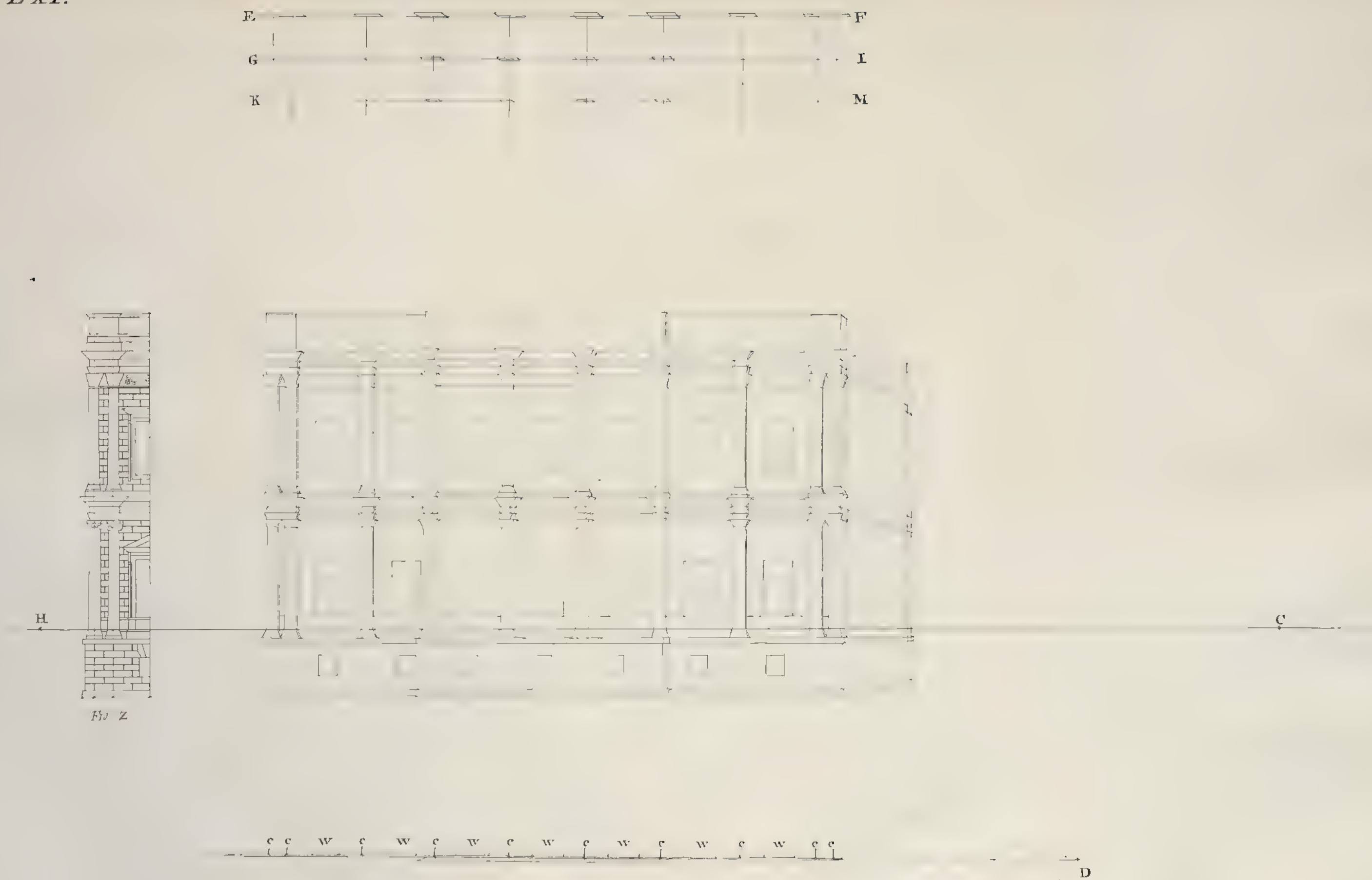

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Plate LXII

H

C

Jones, Architect

J. Patton Sculp.

Plate LXIII.

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PLATE LXIII

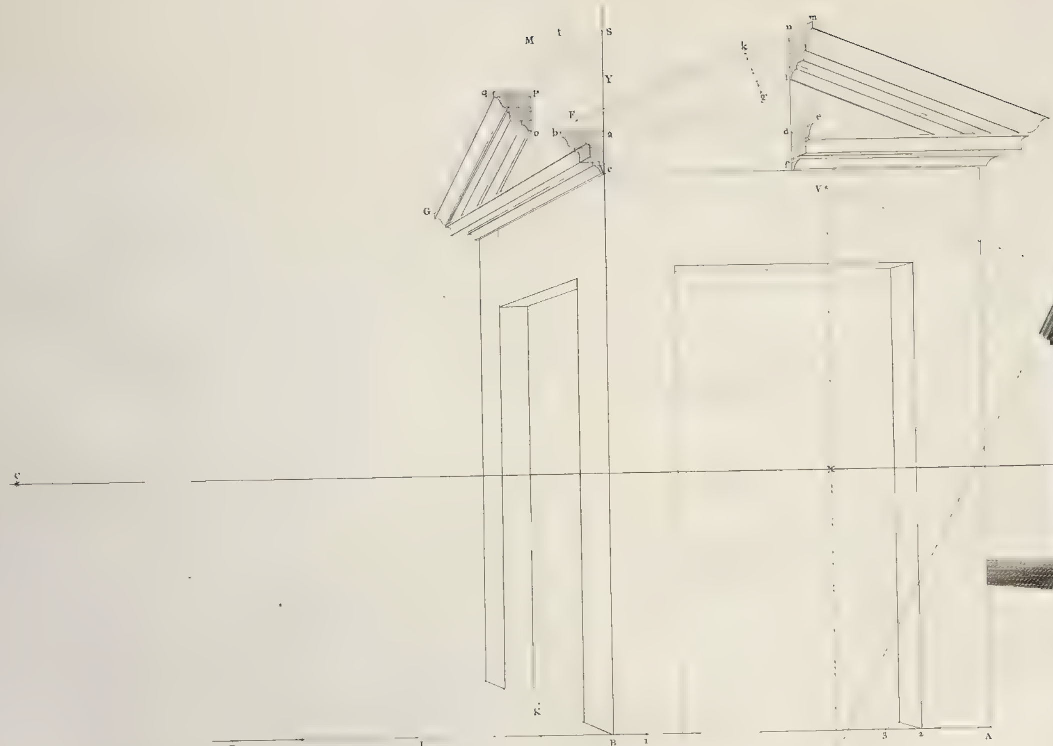

Fig 1

Fig 2

F. Patton sculp.

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Plate LXVI.

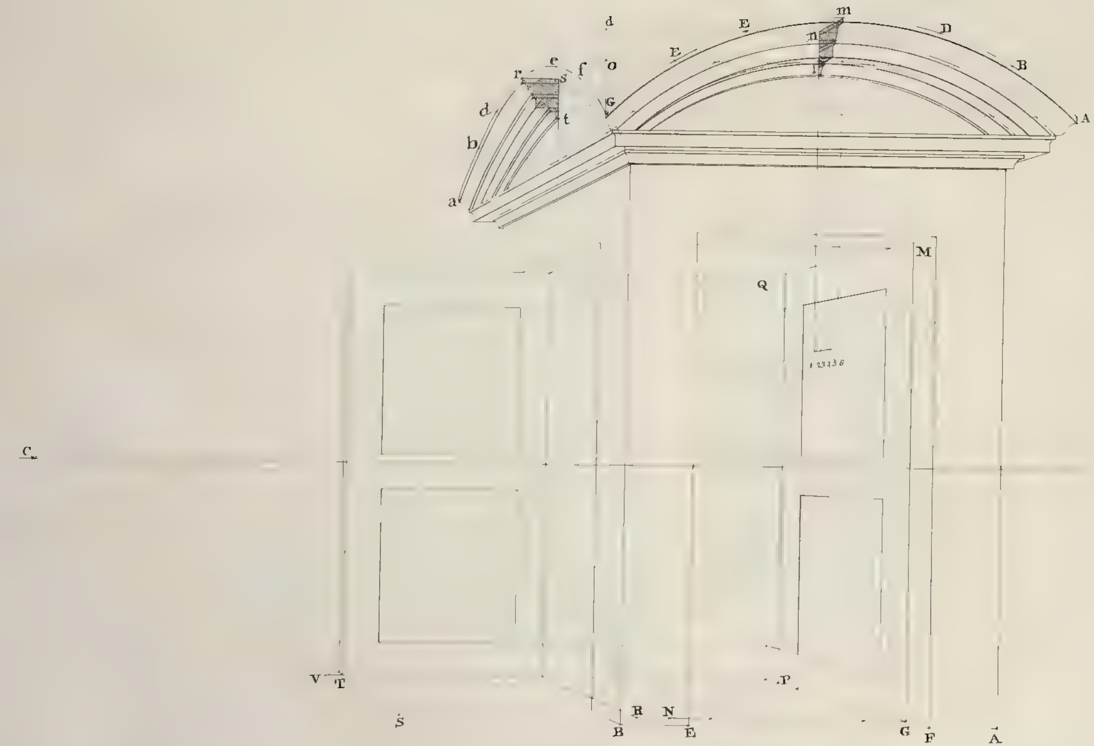

Fig. 1.

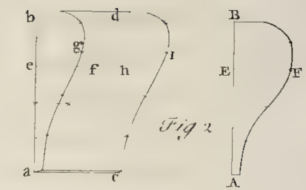

Fig. 2

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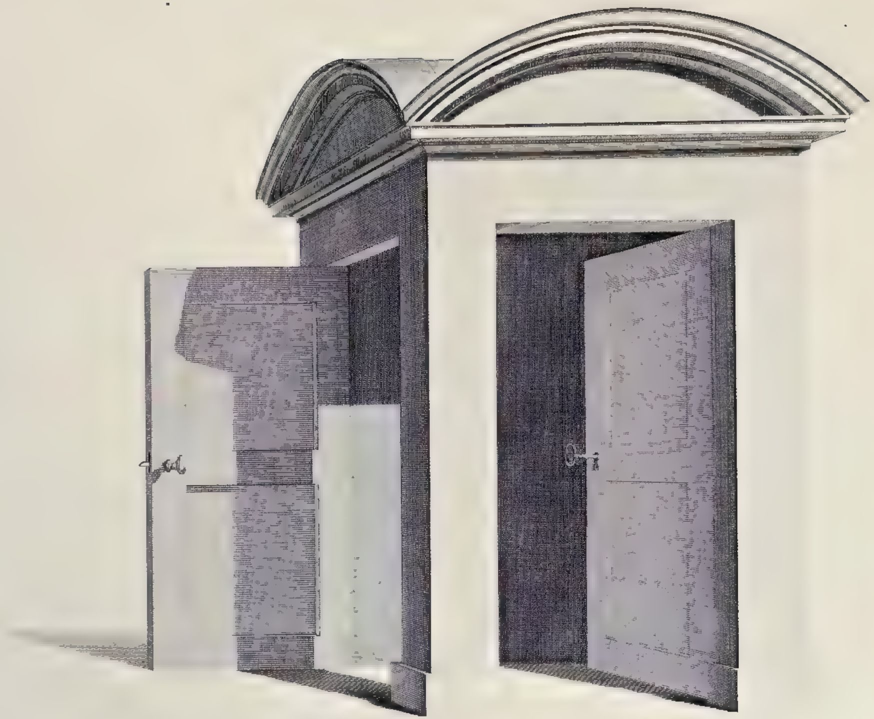
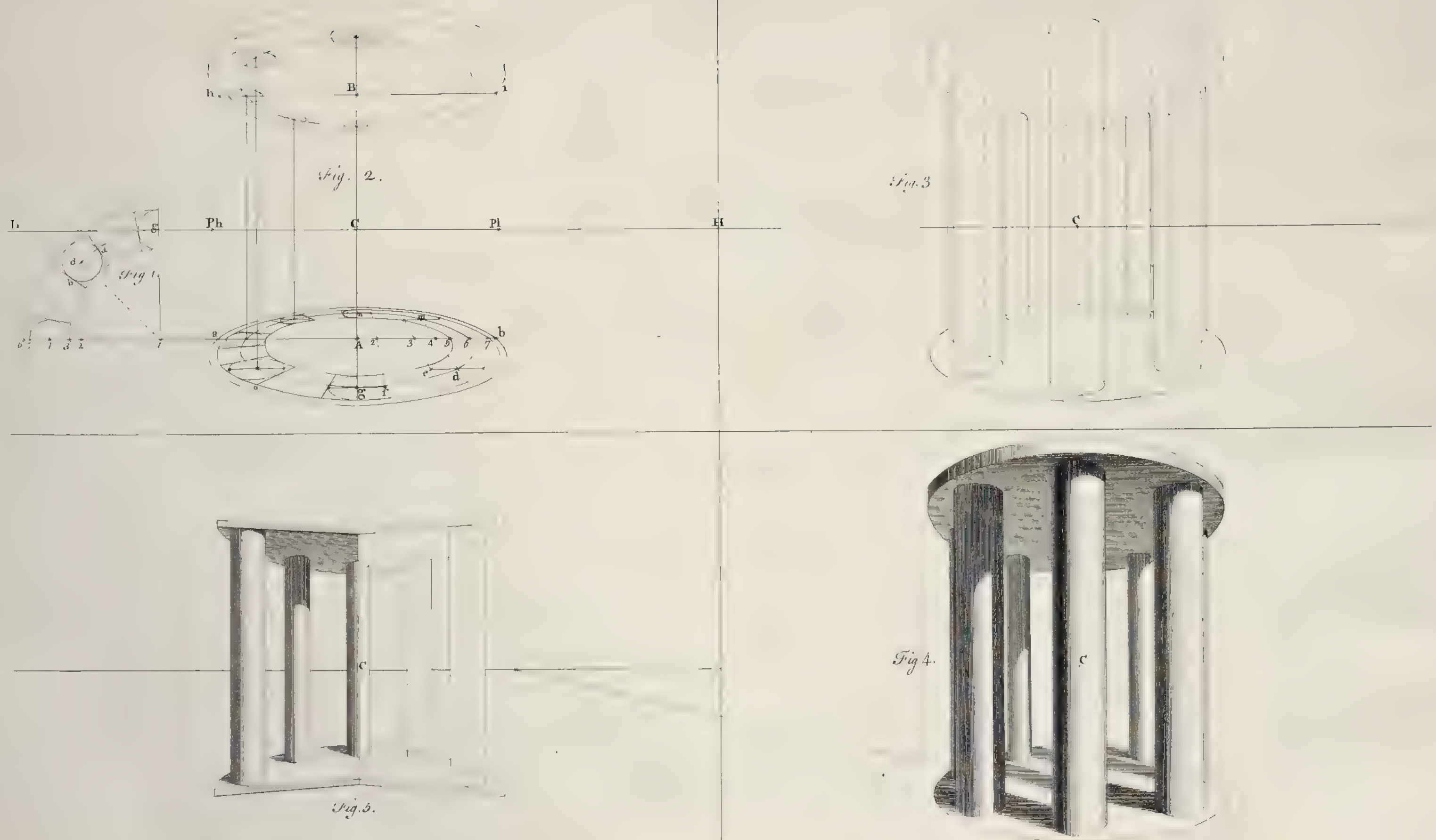
Plate LXVII.



F. Patton Sc.

Plate LXVIII



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F. Patton Sculp.

Plate LXIV.

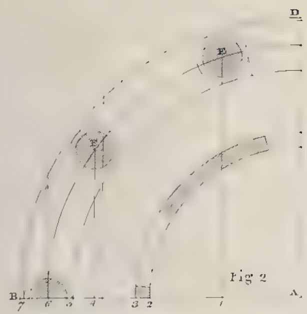

Fig 2

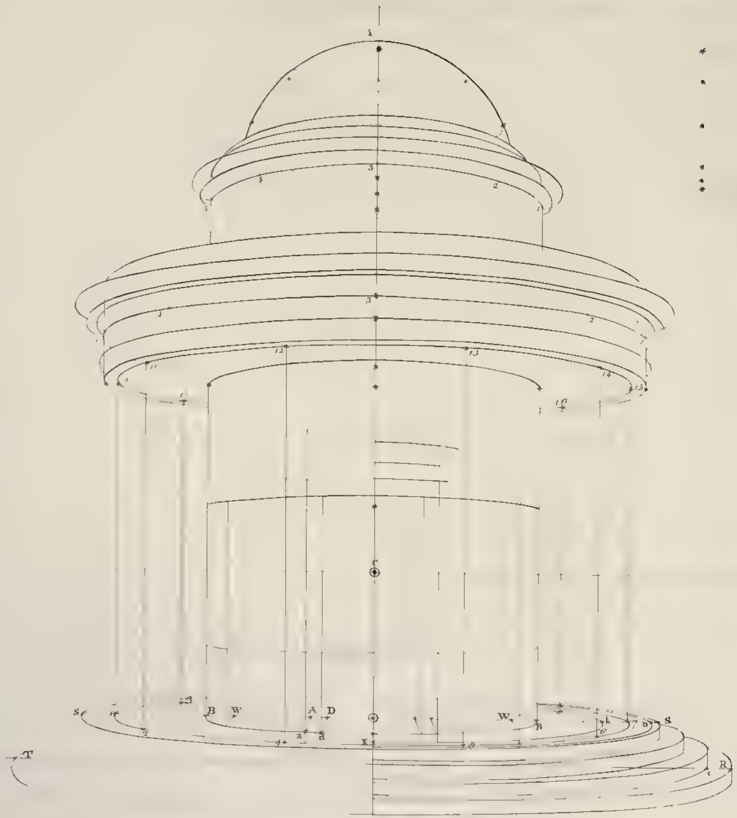

Fig 3.

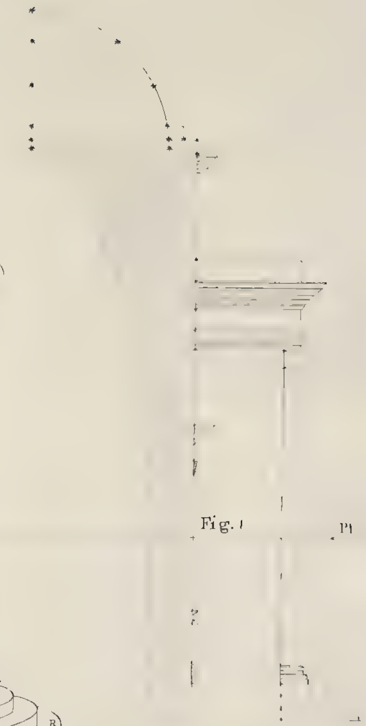

Fig. 1

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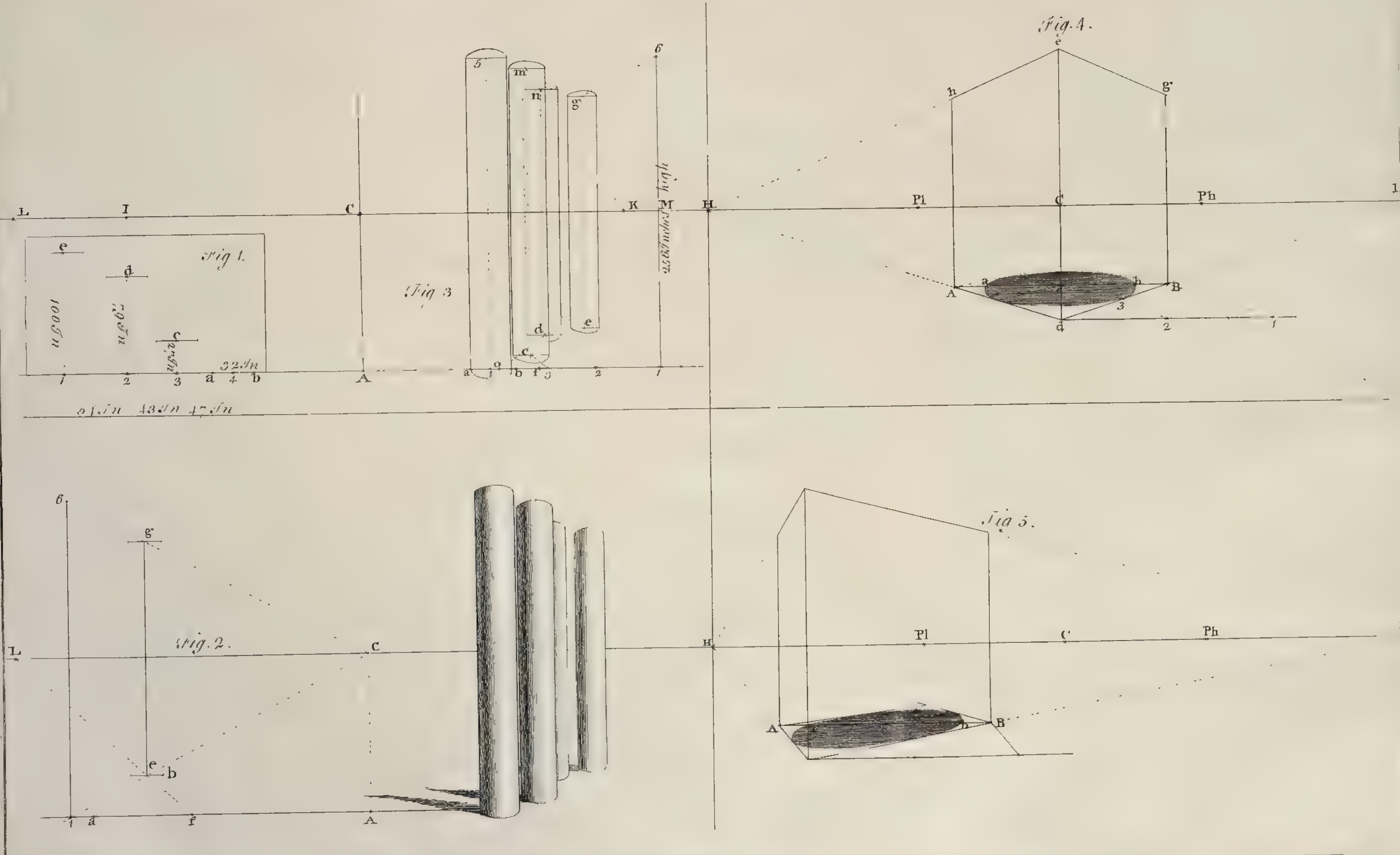
Plate LXX

A Walker Sculp

Plate LXXI.



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Kirby jun. Sculp.

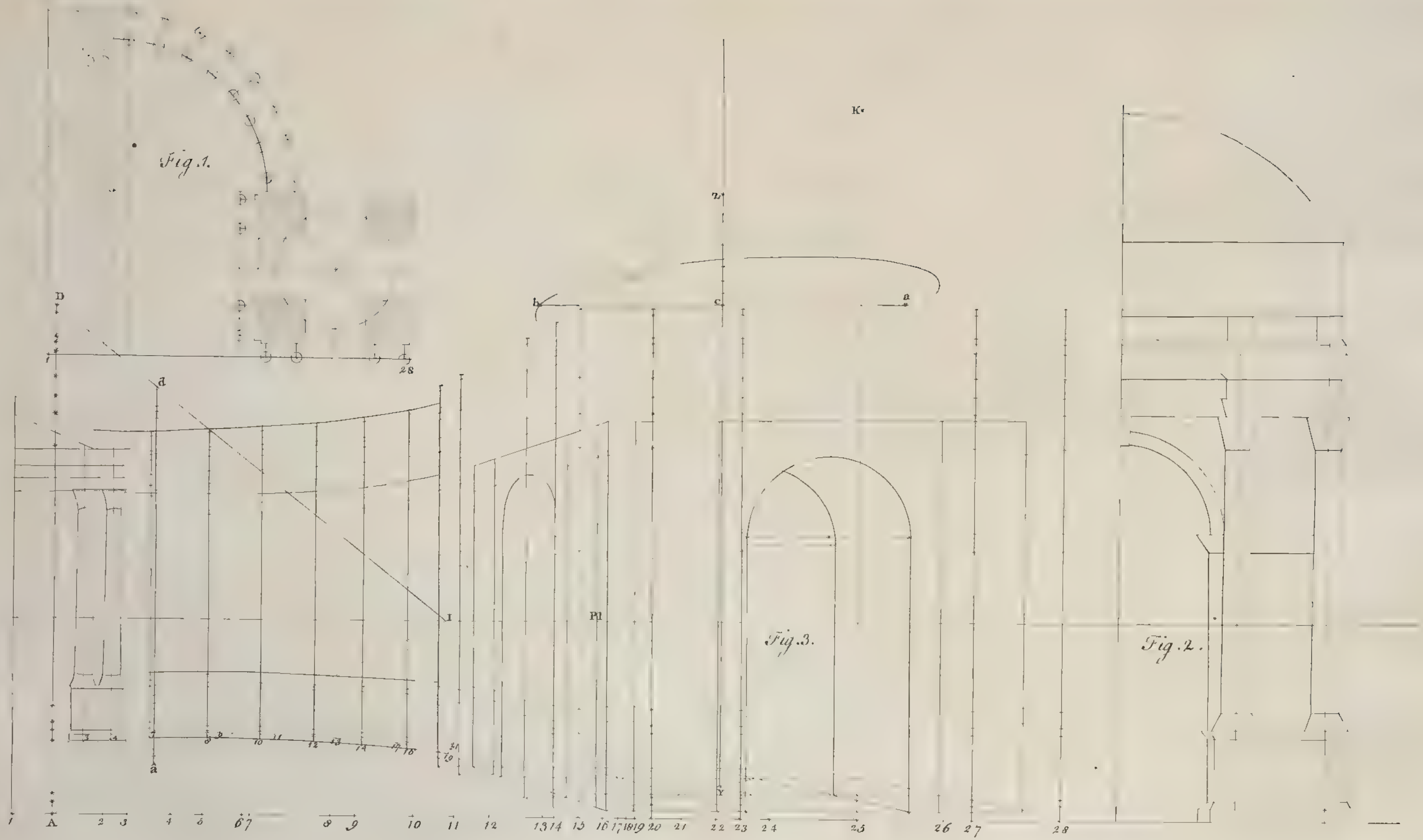

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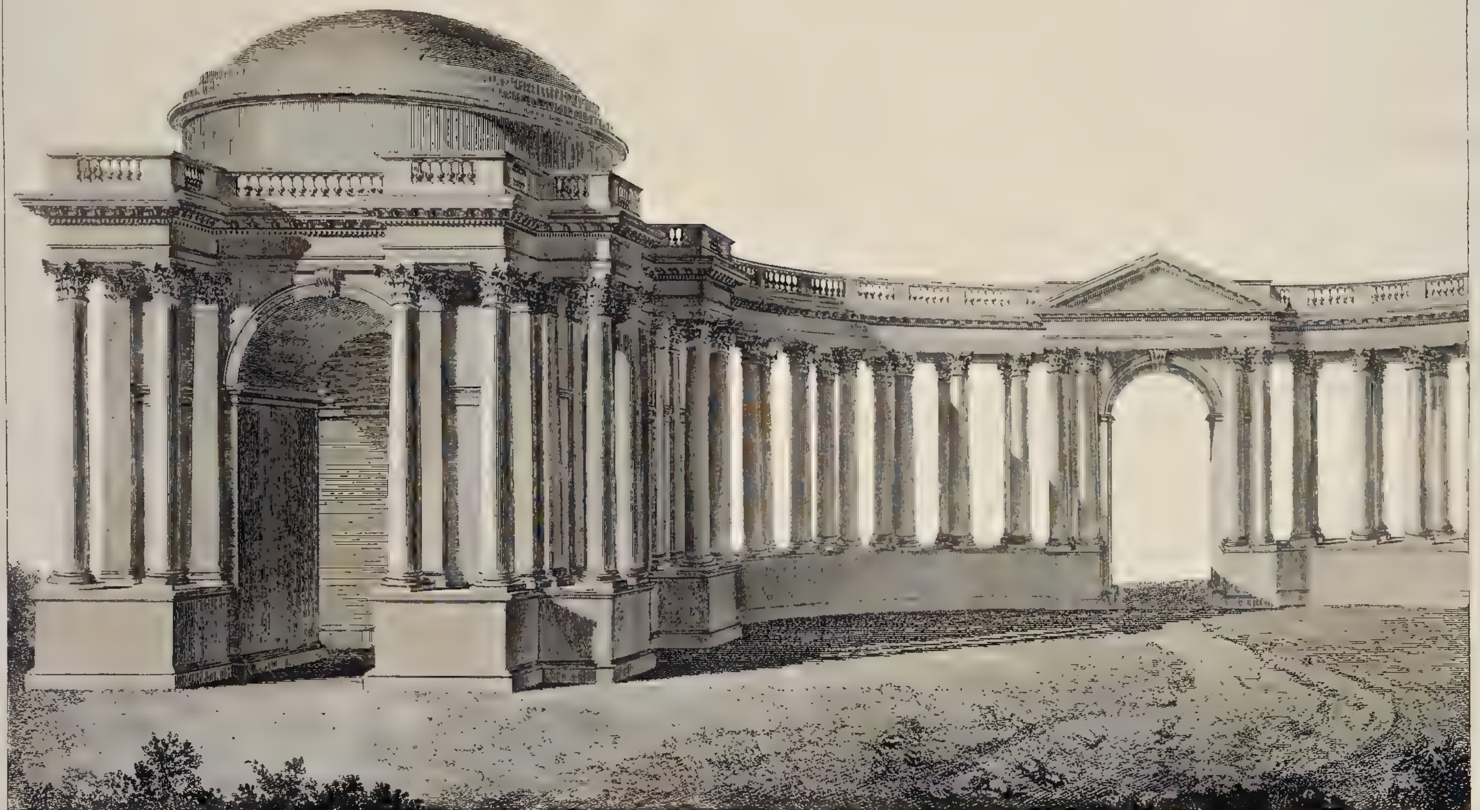
PLATE LXXIII



I N D E X.

P A R T I.

P A R T II.

For

E R R A T A.

P A R T I.

PAGE 5, line 39, for done but as, read done as—p. 6, l. 38, for know, r. have—p. 15, l. 37, for conſoles, r. conſoles at large—p. 18, l. 34, dele out D G—p. 33, l. 25, at the beginning of the line put, PLATE IX—p. 77, l. 13, for to d, r. To.

P A R T II.

INTRODUCTION, page 2, line 27, for each, read, ſome—p. 2, l. 46, for line, r. plane—p. 4, l. 33, for line, r. lines—p. 10, l. 39, for point draw d, r. point d—ibid. l, 43, for by then, r. then by—p. 17, l. 30, for Fig. B, viz. r. Fig. E, Plate XVII—p. 18, l. 26, for a b of, r. a b of the ſide—ibid. l. 33, for points and, r. points e, e, and—p. 19, l. 36, for next plate, r. plate—p. 27, l. 18, for ſince it, r. ſince this part—p. 32, l. 13, for ſoffit, r. the ſoffit—p. 37, l. 4, for draw the, r. draw lines to cut the—ibid. l. 40, for is N the, r. is N the vaniſhing point of—p. 46, l. 5, for D F, r. d f—ibid, l. 40, for projection, r. projections—p. 48, l. 36, for C, r. A, C—p. 49, l. 11, for therby, r. thereby—ibid. l. 22, for column, r. columns—p. 51, l. 15, for ending, r. tending—p. 53, l. 37, for C, r. c—ibid. l. 41, for ſide, r. ſides. There is alſo an unneceſſary uſe made of the words chapter and ſection, in a few parts of this work, which the candid reader will overlook, as matters of no conſequence.

Directions for placing the P L A T E S.

THOSE marked B 1 to Plate XXV, ſhould be placed firſt, as belonging to the Architectonic Sector; and if bound up with the letter-preſs, ſhould follow at the end of the deſcription and uſe of that inſtrument.

THE other plates, from plate I, to plate LXXIII, ſhould follow in their order, at the end of the letter-preſs, belonging to the Perſpective.

BUT the beſt method by far, is to bind the letter-preſs and plates in ſeparate volumes.

ls

c+c fur T.T.
[illegible]

$\frac{CXS}{FA/83}$

73
26

99